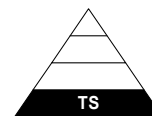


This draft, March 16, 2001, prepared by the Office of Environment, Safety and Health has not been approved and is subject to modification. Project No. SDMP-0026.



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# DOE HANDBOOK

## GLOSSARY OF SAFETY AND HEALTH TERMS



**U.S. Department of Energy  
Washington, D.C. 20585**

**AREA SDMP**

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## 1. INTRODUCTION

### 1.1 Purpose

To serve as a reference for Department of Energy (DOE) Office of Environment, Health and Safety (ES&H or EH) terms and their definitions.

### 1.2 Background

A glossary of safety-related terms was created several years ago by a policy group in the Office of Nuclear Energy (NE), NE-70. When this division was reorganized under EH, the glossary migrated along with the technical staff and fell into disuse.

As a result of the October 16, 1995, reorganization of the Directive System by DOE O 251.1, a DOE Glossary was developed to streamline DOE Orders and to prevent confusion caused by inconsistent definitions of the same terms in DOE Orders and Manuals. "New Series Directives" (3-digit directives) were developed through a binning process including most EH safety orders. With the new Glossary to serve as the central repository for terms and definitions, it was agreed that all New Series Orders and Manuals would cease to have a definitions section. However, to prevent the Glossary from becoming a very burdensome document with potentially hundreds of pages of terms, it was decided that certain specialized program areas, such as the safeguards and security program, would maintain their own glossaries of terms. In addition, a term would be omitted or not included if it fit into one of the following four categories:

- 1) Term is defined in a Federal law or statute; or the Code of Federal Regulations.
- 2) Term is defined in DOE Technical Standards.
- 3) Terms with a definition commonly understood in Government, i.e., supervisor, division, performance appraisal, etc.; however, some exceptions were made, i.e., Secretarial Officer, Department Element, etc.
- 4) Commonly used terms that have many meanings.

This so-called DOE Glossary was frozen on May 16, 1996, and put on the DOE

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Explorer System.

EH policy for several years has been to convert health and safety DOE Orders to Rules under the Code of Federal Regulations. In addition, the DOE Technical Standards Program resides in EH. Terms in orders, manuals, and guides associated with rulemakings as well as those terms associated with technical standards and the Program were expressly excluded from the DOE Glossary.

To return the excluded health and safety terminology to the DOE Glossary, an effort was undertaken to catalog these terms and to incorporate them into a comprehensive list. The DOE Glossary of Safety and Health Terms that follows, now to be a stand-alone document, is the result of this effort. It is a living document that endeavors to maintain a balanced approach among technical disciplines. This handbook is not inclusive since some organizations in EH elected not to incorporate their health and safety terms in the list.

This DOE Glossary of Safety and Health Terms combines salient terms collected in 1997 from order and rule writers in EH, the final version of an earlier NE/EH glossary from 1993-1994 (identified as source EH62dd1), terms from the Manual of Safety Management Functions, Responsibilities, and Authorities (DOE M 411.1-1) and the Integrated Safety Management System Guide Appendix A (DOE G 450.4-1), definitions from rules 10 CFR 707, 10 CFR 708, 10 CFR 820, 10 CFR 830, 10 CFR 835, and 10 CFR 850, definitions from the DOE Technical Standards Program, terms from standards and handbooks on maintenance including the Life Cycle Asset Management Order (DOE O 430.1), and terms from the fire protection standard DOE-STD-1066-97.

There are multiple definitions for some terms because these terms are used in different contexts and/or derive from different sources. The source of each term is identified where possible. Obviously, some sources are more authoritative than others. Terms defined in statutes take precedent over the same terms grounded in New or Old Series (4-digit directives) DOE Orders. The hierarchy of source authority proceeds downward to manuals, guides, standards, the current DOE Glossary, and the old NE/EH glossary generally in that order. There is often a rationale for incorporating terms from a less authoritative source such as technical accuracy or specificity.

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### 1.3 Application

The contents of this handbook are generally applicable to all DOE nuclear and non-nuclear facilities. Users should select those terms applicable to their needs noting the source cited. DOE handbooks are not mandatory directives, and it is not expected that these definitions will always be used. The reader may wish to consult the latest DOE guidance for newer definitions. However, any new usage for a term in this Glossary would risk introducing the confusion the document is intended to prevent.

The DOE Office of NEPA Policy and Assistance, EH-42, has issued its own glossary of technical and regulatory terms most commonly encountered in NEPA documents. This “Glossary of Terms Used in DOE NEPA Documents” is available electronically on the Web at <http://tis.eh.doe.gov/nepa/>. It has been reformatted for inclusion in this DOE Glossary of Safety and Health Terms as an appendix. There are currently 182 terms defined in the NEPA Glossary, 22 of which appear to duplicate terms in this Glossary. A comparison of the definitions for the 22 terms that appear in both the DOE Glossary of Safety and Health Terms and the NEPA Glossary yields the following in the opinion of this author:

Better definitions for the terms ALARA, COLLECTIVE DOSE, COMMITTED DOSE EQUIVALENT ( $H_{T-50}$ ), FISSIONABLE MATERIALS, LOW-LEVEL WASTE (LLW), QUALITY FACTOR, RADIATION, and WEIGHTING FACTOR ( $W_T$ ) will be found in the main text, the DOE Glossary of Safety and Health Terms. Definitions for DOSE EQUIVALENT (H) and EFFECTIVE DOSE EQUIVALENT (EDE) in the NEPA glossary while “derived from” explain the term equivalent, whereas the definitions in main text pass that question on to the definition of QUALITY FACTOR. The NEPA glossary definition of HAZARD ANALYSIS, while a derivation, is organized more rationally than that in this Glossary. The NEPA glossary definition for NUCLEAR FACILITY derived from obsolete DOE O 6340.1A and DOE O 5480.30 is an interesting discussion. The NEPA definition for RISK is stronger than that presented in this Glossary. The NEPA glossary definition for SAFETY ANALYSIS REPORT (SAR), though a derivation from statute associated with the U.S. Nuclear Regulatory Commission, is more complete and uses better grammar than either of the two definitions in the text of the DOE Glossary of Safety and Health Terms. The composite definition for SPECIAL NUCLEAR MATERIAL (SNM) in the NEPA listing is less complicated and less redundant than that cited in this Glossary (exact quote from 10 CFR 707.4).

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NEPA definitions for ABSORBED DOSE (D), ACCIDENT, BASELINE, DESIGN BASIS ACCIDENT, EFFECTIVE DOSE EQUIVALENT ( $H_E$ ), TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE), and TRU WASTE can coexist with the more authoritative definitions in this Glossary. BASELINE as defined in this Glossary is in a Life Cycle Management context while the NEPA definition is primarily for use in NEPA documents. A best definition for TRU WASTE might be a combination of the definition in the DOE Glossary of Safety and Health Terms with the appendix NEPA presentation.

An additional 368 page “Glossary of Terms Related to CERCLA, EPCRA, PPA, RCRA, and TSCA” resides on the Internet Website of the Office of Environmental Policy and Assistance, EH-41, <http://www.eh.doe.gov/oepa>. This glossary is nearly four times the size of the DOE Glossary of Safety and Health Terms and not feasible as a second appendix. The reader is directed to the cited Web page without further discussion.

The current version of this handbook incorporates comments generated during a 60-day coordination on the DOE Technical Standards Home Page that concluded on January 28, 2000. Also incorporated are salient terms from the 10 CFR 830 rule published in the spring of 2001 and 10 CFR 850, “Chronic Beryllium Disease Prevention Program; final Rule.”

This Glossary was compiled by M. Norman Schwartz and is currently maintained by EH-53, the Office of Nuclear and Facility Safety Policy, where he works.

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## 2. GLOSSARY OF SAFETY AND HEALTH TERMS

1. ABSORBED DOSE (D). The energy absorbed by matter from ionizing radiation per unit mass of irradiated material at the place of interest in that material. The absorbed dose is expressed in units of rad (or gray) (1 rad = 0.01 gray). [10 CFR 835.2]
2. ACCEPTABLE. When applied to fire safety, "acceptable" is a level of protection which the Authority Having Jurisdiction, after consultation with the cognizant DOE fire protection engineer(s), considers sufficient to achieve the fire and life safety objectives defined in DOE Orders. In some instances, it is the level of protection necessary to meet a code or standard. In other instances it is a level of protection that deviates (plus or minus) from a code or standard as necessary and yet adequately protects against the inherent fire hazards. [DOE-STD-1066-97]
3. ACCIDENT. An unwanted transfer of energy or an environmental condition that, due to the absence or failure of barriers or controls, produces injury to persons, damage to property, or reduction in process output. [DOE G 225.1A-1]
4. ACCIDENT ANALYSES. For the purposes of properly implementing DOE O 5480.21, the term accident analyses refers to those bounding analyses selected for inclusion in the safety analysis report. These analyses refer to design basis accidents only. [DOE O 5480.21] [EH62dd1]
5. ACCIDENT (EXPLOSIVE). An incident or occurrence that results in an uncontrolled chemical reaction involving explosives. [DOE O 6430.1A]
6. ACCOUNTABILITY. The state of being liable for explanation to a superior DOE official for the exercise of authority. Ultimate accountability is to the Secretary, who may delegate authority or share responsibility for specified actions. The designee of an authority is accountable to the delegating responsible authority for the proper and diligent exercise of that authority. Responsibility differs from accountability in that a responsible official "owns" the function for which he or she is responsible; it is an integral part of his or her duties to see that the function is properly executed, to establish criteria for the judgement of excellence in its execution, and to strive for continuous improvement in that execution. A responsible official is associated with the outcomes of the exercise of authority



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regardless of whether it was delegated or not, and regardless of whether or not the designee properly followed guidance. Accountability, on the other hand, involves the acceptance of the authority for execution or for further delegation of components of execution, by using guidance and criteria established by the responsible authority. [DOE M 411.1-1A]

7. ACTION LEVEL. The level of airborne concentration of beryllium established pursuant to section 850.23 of CFR Part 850 that, it met or exceeded, requires the implementation of worker protection provisions specified in section 850.23. [10 CFR 850.3]
8. ACT OR AEA. The Atomic Energy Act of 1954, as amended. [10 CFR 820.2]
9. ADDITIONS AND MODIFICATIONS. Changes to a structure, system, and component (SSC) for reasons other than increasing resistance to natural phenomena hazards. [In the context only of DOE IG-420.1.4]
10. ADMINISTRATIVE CONTROLS. Provisions relating to organization and management, procedures, recordkeeping, assessment, and reporting necessary to ensure safe operation of a facility. [10 CFR 830.3]
11. ADMINISTRATIVE CONTROLS. Provisions relating to organization and management, procedures, record keeping, assessment, and reporting necessary to ensure safe operation of a facility. With respect to nuclear facilities *administrative controls* means the section of the Technical Safety Requirements (TSRs) containing provisions for safe operation of a facility including (1) requirements for reporting violations of TSRs, (2) staffing requirements important to safe operations, and (3) commitments to the safety management programs and procedures identified in the Safety Analysis Report as necessary elements of the facility safety basis provisions. [ISMS Guide] [First sentence only, 10 CFR 830.3]
12. ADMINISTRATIVE LAW JUDGE. An Administrative Law Judge appointed under 5 U.S.C. 3105. [10 CFR 820.2]
13. ADMINISTRATIVE LIMITS. Those procedural limits, self-imposed by the contractor, relating to nuclear safety. These limits are generally more restrictive and specific than externally imposed limits by Federal, State, or other entities. [DOE O 5480.30] [EH62dd1]

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14. AIRBORNE RADIOACTIVE MATERIAL OR AIRBORNE RADIOACTIVITY. Radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors, or gases. [10 CFR 835.2]
15. AIRBORNE RADIOACTIVITY AREA. Any area, accessible to individuals, where:
  - The concentration of airborne radioactivity, above natural background, exceeds or is likely to exceed the derived air concentration (DAC) values listed in appendix A or appendix C of this part; or
  - An individual present in the area without respiratory protection could receive an intake exceeding 12 DAC-hours in a week. [10 CFR 835.2]
16. ALARA. "As Low As is Reasonably Achievable," which is the approach to radiation protection to manage and control exposures (both individual and collective) to the work force and to the general public to as low as is reasonable, taking into account social, technical, economic, practical, and public policy considerations. ALARA is not a dose limit but a process which has the objective of attaining doses as far below the applicable limits of 10 CFR 835 as is reasonably achievable. [10 CFR 835.2]
17. AMBIENT AIR. The general air in the area of interest (e.g., the general room atmosphere), as distinct from a specific stream or volume of air that may have different properties.
18. ANALYSIS. The use of methods and techniques of arranging data to: (a) assist in determining what additional data are required; (b) establish consistency, validity, and logic; (c) establish necessary and sufficient events for causes; and (d) guide and support inferences and judgements. [DOE G 225.1A-1]
19. ANALYTICAL TREE. Graphical representation of an accident in a deductive approach (general to specific). The structure resembles a tree - that is, narrow at the top with a single event (accident), then branching out as the tree is developed, and identifying root causes at the bottom branches. [DOE G 225.1A-1]
20. ANNUAL LIMIT ON INTAKE (ALI). The derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man (ICRP Publication 23) that would result in a committed

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effective dose equivalent of 5 rems (0.05 sievert) or a committed dose equivalent of 50 rems (0.5 sievert) to any individual organ or tissue. ALI values for intake by ingestion and inhalation of selected radionuclides are based on Table 1 of the U.S. Environmental Protection Agency's Federal Guidance Report No. 11, *Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion*, published September 1988. This document is available from the National Technical Information Service, Springfield, VA. [10 CFR 835.2]

21. ANTICIPATED OPERATIONAL OCCURRENCE OR EVENT. An abnormal event that is expected to occur during the lifetime of the facility (e.g., small radioactive materials spills, small fires). [DOE O 5480.30] [EH62dd1]
22. APPOINTING OFFICIAL. A designated authority responsible for assigning Accident Investigation Board Type A and Type B investigations, with responsibilities as prescribed in Paragraph 5d of DOE O 225.1A. [DOE O 225.1A]
23. APPROVED STORAGE CONTAINER. A container that is fabricated from noncombustible materials); that satisfies container integrity criteria developed from the safety analysis for the particular form(s) of stored material under normal storage conditions, Design Basis Flood (DBF) and other Design Basis Accident (DBA) conditions; and that is approved for its intended use by the responsible DOE operating contractor and the responsible DOE field/Operations organization. [DOE O 6430.1A]
24. ASSESSMENT/VERIFICATION. The act of reviewing, inspecting, testing, checking, conducting surveillances, auditing, or otherwise determining and documenting whether items, processes, or services meet specified requirements. The terms assessment and verification, as used in DOE O 5700.6C, are synonymous; their use is determined by who is performing the work. Assessments are performed by or for senior management. Verifications are performed by the line organization. [DOE O 5700.6C] [EH62dd1]
25. ASSETS. See Physical Assets. [DOE O 430.1A]
26. ASSET MANAGEMENT SYSTEMS. Processes and/or procedures that are employed for non-programmatic management of a facility or physical asset. [DOE O 430.1A]

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27. AUDITABLE DATA. Information which is documented and organized in a readily understandable and traceable manner that permits independent auditing of inferences or conclusions based on the information. [DOE O 5480.EIS] [EH62dd1]
28. AUTHORITY. The basis under which a DOE employee is empowered to take an action. Such actions include approval of a proposal, stopping work, or directing a contractor to perform work. The basis for an authority may be a public law, a DOE directive, or the written delegation of the responsible authority empowered by such a basis.
29. AUTHORITY HAVING JURISDICTION (AHJ). The decision making authority in matters concerning fire protection. The DOE Head of Field Organization or designee is the final AHJ unless otherwise directed by the Cognizant Secretarial Officer. [DOE-STD-1066-97]
30. AUTHORIZATION AGREEMENT. A documented agreement between DOE and the contractor for high-hazard facilities (Category 1 and 2), incorporating the results of DOE's review of the contractor's proposed authorization basis for a defined scope of work. The authorization agreement contains key terms and conditions (controls and commitments) under which the contractor is authorized to perform work. Any changes to these terms and conditions would require DOE approval. [DNFSB/TECH-16]
31. AUTHORIZATION BASIS. Those aspects of the facility design basis and operational requirements relied upon by DOE to authorize operation. These aspects are considered to be important to the safety of facility operations. The authorization basis is described in documents such as the facility Safety Analysis Report and other safety analyses; Hazard Classification Documents, the Technical Safety Requirements, DOE-issued safety evaluation reports, and facility-specific commitments made in order to comply with DOE Orders or policies. [DOE O 5480.21] [EH62dd1]
32. AUTHORIZATION PROTOCOLS. Those processes used to communicate acceptance of the contractor's integrated plans for hazardous work. Such protocols are expected to range from pre-performance review and approval by DOE of detailed safety-related terms and conditions for performing work (authorization agreement) to less rigorous oversight and post-performance assessment of the contractor's work. [DNFSB/TECH-16]

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33. AUTHORIZED PERSON. Any person required by work duties to be in a regulated area. [10 CFR 850.3]
34. BACKFIT. The imposition of a new or proposed nuclear safety requirement which dictates the modification of, or addition to: (1) systems, structures and components of a facility; (2) the existing or approved design of a facility; or (3) the procedures or organization required to design, construct, or operate a facility. [DOE O 5480.5] [EH62dd1]
35. BACKFIT ANALYSIS. A cost/benefit-analysis of proposed backfit. A backfit analysis can be either for a group of facilities or for a specific facility. Backfit analyses are to be judgmental and guided by available quantitative information. [DOE O 5480.5] [EH62dd1]
36. BACKFIT REVIEW COMMITTEE (BRC). The committee established to review the backfit analysis for proposed nuclear safety backfits. This committee shall consist of representatives from each nuclear program office; the Office of Nuclear Safety Policy and Standards; and the Office of Environment, Safety and Health. [DOE O 5480.5] [EH62dd1]
37. BACKGROUND. Radiation from:
- (i) Naturally occurring radioactive materials which have not been technologically enhanced;
  - (ii) Cosmic sources;
  - (iii) Global fallout as it exists in the environment (such as from the testing of nuclear explosive devices);
  - (iv) Radon and its progeny in concentrations or levels existing in buildings or the environment which have not been elevated as a result of current or prior activities; and
  - (v) Consumer products containing nominal amounts of radioactive material or producing nominal amounts of radiation. [10 CFR 835.2]
38. BARRIER. Anything used to control, prevent, or impede energy flows. Common types of barriers include equipment, administrative procedures and processes,

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supervision/management, warning devices, knowledge and skills, and physical objects. Barriers may act as control or safety. [DOE G 225.1A-1]

39. BARRIER ANALYSIS. An analytical technique used to identify energy sources and the failed or deficient barriers and controls that contributed to an accident. [DOE G 225.1A-1]
40. BASELINE. A quantitative expression of projected costs, schedule, and technical requirements; the established plan against which the status of resources and the progress of a project can be measured. [DOE O 430.1A]
41. BASES APPENDIX. An appendix that describes the basis of the limits and other requirements in technical safety requirements. [10 CFR 830.3]
42. BERYLLIUM. Elemental beryllium and any insoluble beryllium compound or alloy containing 0.1 percent beryllium or greater that may be released as an airborne particulate. [10 CFR 850.3]
43. BERYLLIUM ACTIVITY. An activity taken for, or by, DOE at a DOE facility that can expose workers to airborne beryllium, including but not limited to design, construction, operation, maintenance, or decommissioning, and which may involve one DOE facility or operation or a combination of facilities and operations. [10 CFR 850.3]
44. BERYLLIUM ARTICLE. A manufactured item that is formed to a specific shape or design during manufacture, that has end-use functions that depend in whole or in part on its shape or design in whole or in part on its shape or design during end use, and that does not release beryllium or otherwise result in exposure to airborne concentrations of beryllium under normal conditions of use. [10 CFR 850.3]
45. BERRYLLIUM-ASSOCIATED WORKER. A current worker who is or was exposed or potentially exposed to airborne concentrations of beryllium at a DOE facility, including:
  - A. A beryllium worker;
  - B. A current worker whose work history shows that the worker may have been exposed to airborne concentrations of beryllium at a DOE facility;
  - C. A current worker who exhibits signs or symptoms of beryllium exposure; and
  - D. A current worker who is receiving medical removal protection benefits.[10 CFR 850.3]

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46. BERYLLIUM EMERGENCY. Any occurrence such as, but not limited to, equipment failure, container rupture, or failure of control equipment or operations that results in an unexpected and significant release of beryllium at a DOE facility. [10 CFR 850.3]
47. BERYLLIUM-INCLUDED LYMPHOCYTE PROLIFERATION TEST (Be-LPT). An in vitro measure of the beryllium antigen-specific, cell-mediated immune response. [10 CFR 850.3]
48. BERYLLIUM WORKER. A current worker who is regularly employed in a DOE beryllium activity. [10 CFR 850.3]
49. BIOASSAY. The determination of kinds, quantities, or concentrations, and , in some cases, locations of radioactive material in the human body, whether by direct measurement or by analysis, and evaluation of radioactive materials excreted or removed from the human body. [10 CFR 835.2]
50. BREATHING ZONE. A hemisphere forward of the shoulders, centered on the mouth and nose, with a radius of 6 to 9 inches. [10 CFR 850.3]
51. BREATHING ZONE. A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches (i.e., an area as close as practicable to the nose and mouth of the employee being monitored for a chemical or biological hazard). Breathing zone samples provide the best representation of actual exposure. [DOE G 440.1-3]
52. BUILDING. A roofed structure that is suitable for housing people, material, or equipment. Also included are sheds and other roofed structures that provide partial protection from the weather and elements. [DOE O 4330.4A] [EH62dd1]
53. CALIBRATION. To adjust and/or determine either:
  - (i) The response or reading of an instrument relative to a standard (e.g., primary, secondary, or tertiary) or to a series of conventionally true values; or
  - (ii) The strength of a radiation source relative to a standard (e.g., primary, secondary, or tertiary) or conventionally true value.[10 CFR 835.2]

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54. CANDIDATES FOR TRANSFER. Land and facilities that include: a) contaminated facilities for which DOE has responsibility or owns; (b) contaminated portions of facilities, if structurally independent and with separate utilities and support systems; (c) real property or related personal property that is ancillary to a candidate facility; (d) facilities otherwise agreed to by the DOE parties involved. [DOE O 430.1A]
55. CASED EXPLOSIVES. Explosives that are enclosed in a physical protective covering that will retain the explosives securely and will offer significant protection against accidental detonation during approved handling and intraplant transportation operations. [DOE O 6430.1A]
56. CATEGORY A REACTOR FACILITIES. Those production, test, research reactors designated by DOE based on power level (e.g., design thermal power rating of 20 megawatts steady state and higher) potential fission product inventory, and experimental capability. [DOE O 5480.30]
57. CATEGORY B REACTOR FACILITIES. Those test and research reactors designated by DOE based on power level (e.g., design thermal power rating of less than 20 megawatts steady state), potential fission product inventory, and experimental capability. [DOE O 5480.30]
58. CAUSAL FACTOR. An event or condition in the accident sequence necessary and sufficient to produce or contribute to the unwanted result. Causal factors fall into three categories: direct cause, contribution cause, and root cause. [DOE G 225.1A-1]
59. CAUSE. Anything that contributes to an accident or incident. In an investigation, the use of the word "cause" as a singular term should be avoided. It is preferable to use it in the plural sense, such as "causal factors," rather than identifying "the cause." [DOE G 225.1A-1]
60. CEILING LIMIT. The concentration in the employee's breathing zone that shall not be exceeded at any time during any part of the working day. For airborne contaminants, if instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time-weighted average exposure that shall not be exceeded at any time during the working day. [DOE O 5480.10A (Draft)]



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61. CERTIFICATION. The process by which contractor facility management provides written endorsement of the satisfactory achievement of qualification of a person for a position. [DOE O 5480.30]
62. CHAIN OF CUSTODY. The process of documenting, controlling, securing, and accounting for physical possession of evidence, from initial collection through final disposition. [DOE G 225.1A-1]
63. CHANGE. Stress on a system that was previously in a state of equilibrium, or anything that disturbs the planned or normal functioning of a system. [DOE G 225.1A-1]
64. CHANGE ANALYSIS. An analytical technique used for accident investigations, wherein accident-free reference bases are established, and changes relevant to accident causes and situations are systematically identified. In change analysis, all changes are considered, including those initially considered trivial or obscure. [DOE O 225.1A-1]
65. CHANGE CONTROLS. A process that ensures all changes are properly identified, reviewed, approved, implemented, tested, and documented. [DOE-STD-1073-93] [ISMS Guide]
66. CHEMICAL PROCESSING. Those activities or operations that involve the production, use, storage, processing, and/or disposal of caustic, toxic, or volatile chemicals in liquid, gaseous, particulate, powder, or solid states. [EH62dd1]
67. CLASSIFIED INFORMATION. Certain information requiring protection against unauthorized disclosure in the interest of national security (i.e., Restricted Data, Formerly Restricted Data, or National Security Information). [DOE O 4330.4A] [EH62dd1]
68. COLLECTION SITE PERSON. A technician or other person trained and qualified to take urine samples and to secure urine samples for later laboratory analysis. [10 CFR 707.4]
69. COLLECTIVE DOSE. The sum of the total effective dose equivalent values for all individuals in a specified population. Collective dose is expressed in units of person-rem (or person-sievert).

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70. COMBUSTIBLE LIQUID. A liquid having a closed cup flash point at or above 100°F (38°C). [DOE-STD-1066-97]
71. COMBUSTIBLE MATERIAL. Any material that will ignite and burn. Any material that does not comply with the definition of "noncombustible" as contained in DOE-STD-1066-97 is considered combustible. The term combustible is not related to any specific ignition temperature or flame spread rating. [DOE-STD-1066-97]
72. COMMITTED DOSE EQUIVALENT ( $H_{T,50}$ ). The dose equivalent calculated to be received by a tissue or organ over a 50-year period after the intake of a radionuclide into the body. It does not include contributions from radiation sources external to the body. Committed dose equivalent is expressed in units of rem (or sievert). [10 CFR 835.2]
73. COMMITTED EFFECTIVE DOSE EQUIVALENT ( $H_{E,50}$ ). The sum of the committed dose equivalents to various tissues in the body ( $H_{T,50}$ ), each multiplied by the appropriate weighting factor ( $w_T$ )-that is,  $H_{E,50} = \sum w_T H_{T,50}$ . Committed effective dose equivalent is expressed in units of rem (or sievert). [10 CFR 835.2]
74. CONCEPTUAL DESIGN. The activities required to evaluate project design alternatives and to develop sufficient detail to baseline the scope, cost and schedule for project authorization. [DOE O 430.1A]
75. CONCLUSIONS. Significant deductions derived from analytical results. Conclusions are derived from and must be supported by the facts, plus the results of testing and analyses conducted. Conclusions are statements that answer two questions the accident investigation addresses: what happened and why did it happen? Conclusions include concise recapitulations of the causal factors (direct, contributing, and root causes) of the accident determined by the analysis of facts. [DOE G 225.1A-1]
76. CONDITION. Any as-found state, whether or not resulting from an event, that may have adverse safety, health, quality assurance, security, operational or environmental implications. A condition is more programmatic in nature; for example, an error in analysis or calculation, an anomaly associated with design or performance, or an item indicating a weakness in the management process are all conditions. [DOE M 232.1-1A]

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77. CONDITION ASSESSMENT SURVEY (CAS). A periodic inspection of property using universally accepted methods and standards. [DOE O 4330.4B] [EH62dd1]
78. CONFINEMENT AREA. An area having structures or systems from which releases of hazardous materials are controlled. The primary confinement systems are the process enclosures (glove boxes, conveyors, transfer boxes, other spaces normally containing hazardous materials), which are surrounded by one or more secondary confinement areas (operating area compartments). [DOE O 6430.1A]
79. CONFINEMENT BARRIERS.
- A. *Primary confinement*. Provides confinement of hazardous material to the vicinity of its processing. This confinement is typically provided by piping, tanks, glove boxes, encapsulating material, and the like, along with any offgas systems that control effluent from within the primary confinement.
  - B. *Secondary confinement*. Consists of a cell or enclosure surrounding the process material or equipment along with any associated ventilation exhaust systems from the enclosed area. Except in the case of areas housing glove-box operations, the area inside this barrier is usually unoccupied (e.g., canyons, hot cells); it provides protection for operating personnel.
  - C. *Tertiary confinement*. Typically provided by walls, floor, roof, and associated ventilation exhaust systems of the facility. It provides a final barrier against the release of hazardous material to the environment.
80. CONFINEMENT SYSTEM. The barrier and its associated systems (including ventilation) between areas containing hazardous materials and the environment or other areas in the nuclear facility that are normally expected to have levels of hazardous materials lower than allowable concentration limits. [DOE O 5480.30] [EH62dd1]
81. CONFIRMED POSITIVE TEST. For drugs, a finding based on a positive initial or screening test result, confirmed by another positive test on the same sample. The confirmatory test must be by the gas chromatography/mass spectrometry method. [10 CFR 707.4]

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82. CONSENT AGREEMENT. Any written document, signed by the Director and a person, containing stipulations or conclusions of fact or law and a remedy acceptable to both the Director and the person. [10 CFR 820.2]
83. CONSULTANT FIRE SAFETY ASSESSMENT PROGRAM. The program under which fire safety assessments of DOE facilities are conducted for the Office of Safety and Quality Assurance by fire protection engineers from Headquarters and consultants. [DOE O 5480.7A] [EH62dd1]
84. CONTAINMENT SYSTEM. A structurally closed barrier and its associated systems (including ventilation) between areas containing hazardous materials and the environment or other areas in the nuclear facility that are normally expected to have levels of hazardous materials lower than allowable concentration limits. A containment barrier is designed to remain closed and intact during all design basis events. [DOE O 5480.30] [EH62dd1]
85. CONTAMINATED FACILITIES. DOE facilities that have structural components and/or systems contaminated with hazardous chemical and/or radioactive substances, including radionuclides. This definition excludes facilities that contain no residual hazardous substances other than those present in building materials and components, such as asbestos-contained material, lead-based paint, or PCB-containing equipment. This definition excludes facilities in which bulk or containerized hazardous substances, including radionuclides, have been used or managed if no contaminants remain in or on the structural components and/or systems. [DOE O 430.1A]
86. CONTAMINATION AREA. Any area, accessible to individuals, where removable surface contamination levels exceed or are likely to exceed the removable surface contamination values specified in appendix D of this part; but do not exceed 100 times those values. [10 CFR 835.2]
87. CONTINUOUS AIR MONITOR (CAM). An instrument that continuously samples and measures the levels of airborne radioactive materials on a “real-time” basis and has alarm capabilities at preset levels.
88. CONTRACTING OFFICER. A DOE official holding the authority to make purchases or contract for goods and services in excess of \$25,000. Contracting officers are appointed using Standard Form 1402, following procedures in DOE O 542.1, APPOINTMENT OF CONTRACTING OFFICERS AND

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CONTRACTING OFFICER REPRESENTATIVES, which supersedes DOE O 4200.4A. For Headquarters support contracts, the contracting officer is generally a member of the staff of the Assistant Secretary for Human Resources and Administration. [Federal Acquisition Regulation 1.6, Department of Energy Acquisition Regulation 901.6]

89. CONTRACTOR. A seller of goods or services who is a party to a procurement contract as follows:
- A. A Management and Operating Contract;
  - B. Other types of procurement contracts; but this part shall apply to such contracts only with respect to work performed on-site at a DOE-owned or -leased facility; or
  - C. Subcontracts under paragraphs (A) or (B) of this definition; but this part shall apply to such subcontracts only with respect to work performed on-site at a DOE-owned or -leased facility.

[10 CFR 708.4]

90. CONTRACTOR. Any entity under contract with the Department of Energy with the responsibility to perform activities at a DOE site or facility. [10 CFR 835.2]
91. CONTRACTOR SELF-EVALUATION REPORT. A formal report prepared by the contractor summarizing the comparison of a training program to each accreditation objective and its supporting criteria. [DOE O 5480.18B] [EH62dd1]
92. CONTROLLED AREA. Any area to which access is managed by or for DOE to protect individuals from exposure to radiation and/or radioactive material. [10 CFR 835.2]
93. CONTROLLED DOCUMENT. A document whose content is maintained uniform among the copies by an administrative control system. [DOE O 5480.23]
94. CONTROLS. When used with respect to nuclear reactors, apparatus and mechanisms, the manipulation of which directly affects the reactivity or power level of a reactor or the status of an engineered safety feature. When used with respect to any other facility, "controls" means apparatus and mechanisms, the

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manipulation of which could affect the chemical, physical, metallurgical, or nuclear process of the facility in such a manner as to affect the protection of health and safety against radiation. [DOE O 5480.30]

95. CORE SAFETY MANAGEMENT FUNCTIONS. The core safety management functions for DOE P 450.4, SAFETY MANAGEMENT SYSTEM POLICY, are (1) define the scope of work; (2) analyze the hazards; (3) develop and implement hazard controls; (4) perform work within controls; and (5) provide feedback and continuous improvement. These functions are also identified in DEAR 48 CFR 970.5204-2(c). [ISMS Guide]
96. CORRECTIVE (REPAIR) MAINTENANCE. The repair of failed or malfunctioning equipment, system, or facilities to restore the intended function or design condition. This maintenance does not result in a significant extension of the expected useful life. [DOE O 4330.4B] [EH62dd1]
97. CORROSIVE/CAUSTIC CHEMICALS. Chemicals capable of eating away or destroying by chemical action. [DOE O 5480.EQ] [EH62dd1]
98. COST/BENEFIT ANALYSIS. A systematic and documented analysis of the expected costs and benefits related to a particular action. [DOE O 5480.5] [EH62dd1]
99. COUNSELING. Assistance provided by qualified professionals to employees, especially, but not limited to those employees whose job performance is, or might be, impaired as a result of illegal drug use or a medical-behavioral problem; such assistance may include short-term counseling and assessment, crisis intervention, referral to outside treatment facilities, and follow-up services to the individual after completion of treatment and return to work. [10 CFR 707.4]
100. COVERED CONTRACTOR. A seller of items or services involving nuclear facilities under a management and operating contract or subcontract, or at any tier thereunder. [EH62dd1]
101. CRITICAL ASSEMBLY. Special nuclear devices designed and used to sustain nuclear reactions, which may be subject to frequent core and lattice configuration change and which frequently may be used as mockups of reactor configurations. [10 CFR 830.3]

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102. CRITICALITY. The condition in which a nuclear fission chain reaction becomes self-sustaining. [10 CFR 830.3]
103. CRITICALITY ACCIDENT. The release of energy as a result of accidentally producing a self-sustaining or divergent fission chain reaction. [DOE O 421.1A (draft)]
104. CROSSCUT BUDGET. The field/Operations budget data involving capital projects, and real property maintenance, submitted in the specified format in response to the field Budget Call. [DOE O 4330.4A] [EH62dd1]
105. CUMULATIVE TOTAL EFFECTIVE DOSE EQUIVALENT. The sum of the total effective dose equivalents recorded for an individual, where available, for each year of occupational dose was received, beginning January 1, 1989. [10 CFR 835.2]
106. DAMS. As defined in FEMA 93/June 1979, "Federal Guidelines for Dam Safety." [DOE O 5480.28] [EH62dd1]
107. DAY or DAYS. Calendar day(s). [10 CFR 708.4]
108. DEACTIVATION. The process of placing a facility in a stable and known condition including the removal of hazardous and radioactive materials to ensure adequate protection of the worker, public health and safety, and the environment, thereby limiting the long-term cost of surveillance and maintenance. Actions include the removal of fuel, draining and/or deenergizing nonessential systems, removal of stored radioactive and hazardous materials, and related actions. Deactivation does not include all decontamination necessary for the dismantlement and demolition phase of decommissioning, e.g., removal of contamination remaining in the fixed structures and equipment after deactivation. [DOE O 430.1A]
109. DECLARED PREGNANT WORKER. A woman who has voluntarily declared to her employer, in writing, her pregnancy for the purpose of being subject to the occupational exposure limits to the embryo/fetus as provided in § 835.206. This declaration may be revoked, in writing, at any time by the declared pregnant worker. [10 CFR 835.2]

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- 110. DECOMMISSIONING. Takes place after deactivation and includes surveillance and maintenance, decontamination, and/or dismantlement. These actions are taken at the end of the life of a facility to retire it from service with adequate regard for the health and safety of workers and the public and protection of the environment. The ultimate goal of decommissioning is unrestricted release or restricted use of the site. [DOE O 430.1A]
- 111. DECONTAMINATION. The removal or reduction of residual radioactive and hazardous materials by mechanical, chemical or other techniques to achieve a stated objective or end condition. [DOE O 430.1A]
- 112. DEEP DOSE EQUIVALENT. The dose equivalent derived from external radiation at a depth of 1 cm in tissue. [10 CFR 835.2]
- 113. DEFECTIVE ITEM, MATERIAL, OR SERVICE. Includes any item, material, or service that does not meet the commercial standard or procurement requirements as defined in catalogues, proposals, procurement specifications, design specifications, testing requirements, contracts, or the like. It also includes those items, materials, or services found, during acceptance testing, preoperational testing, operations, inspections, or audit, not to meet the quality or reliability requirements appropriate to the use or specificity of the item or service procured. It also includes misrepresentation of the specifications or trademarks associated with the parts/service which fail or are otherwise found to be inadequate because of random failures or errors within the accepted reliability level. [DOE M 232.1-1A]
- 114. DEFENSE IN DEPTH. An approach to facility safety that builds-in layers of defense against release of hazardous materials so that no one layer by itself, no matter how good, is completely relied upon. To compensate for potential human and mechanical failures, defense in depth is based on several layers of protection with successive barriers to prevent the release of hazardous material to the environment. This approach includes protection of the barriers to avert damage to the plant and to the barriers themselves. It includes further measures to protect the public, workers, and the environment from harm in case these barriers are not fully effective. [DOE-STD-3009] [ISMS Guide]
- 115. DEFERRED MAINTENANCE. Maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for a future period. [Deferred Maint. memo.]



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- 116. DEFICIENCY. Any condition that deviates from the designed-in capacity of structures, systems, and components and results in a degraded ability to accomplish its intended function. [DOE-STD-1050-93]
- 117. DEFICIENCY TAG/STICKER. A small tag or adhesive-backed sticker that is used to identify a facility material deficiency. The form may be marked with a serialized number for administrative control, work order identification, and deficiency location by maintenance personnel. [DOE-STD-1050-93]
- 118. DEFLAGRATION. A rapid chemical reaction in which the output of heat is sufficient to enable the reaction to proceed and be accelerated without input of heat from another source. Deflagration is a surface phenomenon, with the reaction products flowing away from the unreacted material along the surface at subsonic velocity. The effect of a true deflagration under confinement is an explosion. Confinement of the reaction increases pressure, rate of reaction and temperature, and may cause transition into a detonation. [DOE M 440.1-1]
- 119. DELEGATION. Written permission sent by a responsible authority to another DOE employee transmitting the authority to perform a specific function on behalf of that responsible authority, usually containing guidance towards the manner in which the authority is to be used. By delegation, the responsible authority cannot diminish his or her responsibility for the consequences of the exercise of the authority.
- 120. DEPARTMENT means the United States Department of Energy or any predecessor agency. [10 CFR 820.2]
- 121. DEPARTMENT OR DOE. Means the Department of Energy. [10 CFR 830.3]
- 122. DERIVED AIR CONCENTRATION (DAC). For the radionuclides listed in appendix A of 10 CFR 835, the airborne concentration that equals the ALI divided by the volume of air breathed by an average worker for a working year of 2000 hours (assuming a breathing volume of 2400 m<sup>3</sup>). For the radionuclides listed in appendix C of this part, the air immersion DACs were calculated for a continuous, non-shielded exposure via immersion in a semi-infinite atmospheric cloud. The value is based upon the derived airborne concentration found in Table 1 of the U.S. Environmental Protection Agency's Federal Guidance Report No. 11, *Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion*, published September 1988.

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This document is available from the National Technical Information Service, Springfield, VA. [10 CFR 835.2]

123. DESIGN BASIS. The design inputs, the design constraints, and the design analysis and calculations. It includes topical areas such as seismic qualification, fire protection, and safe shutdown. It encompasses consideration of such factors as plant availability, plant efficiency, costs, and maintainability, and that subset that relates to safety and the authorization basis. [EH62dd1]
124. DESIGN BASIS. The set of requirements that bound the design of systems, structures, and components within the facility. These design requirements include consideration of safety, plant availability, efficiency, reliability, and maintainability. Some aspects of the design basis are important of safety, although others are not. [DOE O 5480.23]
125. DESIGN BASIS ACCIDENTS. Those postulated accidents that establish design and performance requirements for systems, structures, and components important to safety. [EH62dd1]
126. DESIGN BASIS ACCIDENTS (DBAs). Accidents that are postulated for the purpose of establishing functional requirements for safety significant structures, systems, components, and equipment. [DOE O 5480.23]
127. DESIGN BASIS EARTHQUAKE (DBE) (equivalent to safe shutdown earthquake). An earthquake that is the most severe design basis accident of this type and that produces the vibratory ground motion for which safety class items are designed to remain functional. [DOE O 6430.1A]
128. DESIGN FEATURES. The design features of a nuclear facility specified in the technical safety requirements that, if altered or modified, would have a significant effect on safe operation. [10 CFR 830.3]
129. DESIGN LIFE. The time period during which satisfactory performance can be expected for a specific set of service conditions. [DOE O 5480.EIA] [EH62dd1]
130. DESIGNEE. A person delegated responsibility or authority by a formal memorandum or letter. [DOE O 5480.31] [EH62dd1]

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131. DETERMINISTIC METHOD. The technique in which a single estimate of parameters is used to perform each analysis. To account for uncertainty, several analyses may be conducted with different parameters. [DOE IG-420.1.4]
132. DETONATION. A violent chemical reaction within a chemical compound or mechanical mixture involving heat and pressure. A detonation is a reaction that proceeds through the reacted material toward the unreacted material at a supersonic velocity. The result of the chemical reaction is the exertion of extremely high pressure on the surrounding medium, forming a propagating shock wave that is originally of supersonic velocity. When the material is located on or near the surface of the ground, a detonation is normally characterized by a crater. [DOE M 440.1-1]
133. DIRECTOR. Unless otherwise indicated, the Director, Office of Contractor for Employee Protection. [10 CFR 708.4]
134. DIRECTOR. The DOE Official to whom the Secretary has assigned the authority to issue Notices of Violation under subpart B of this part, including the Director of Enforcement, or his designee. With regard to activities and facilities covered under E.O. 12344, 42 U.S.C. 7158 note, pertaining to Naval nuclear propulsion, the Director shall mean the Deputy Assistant Secretary for Naval Reactors or his designee. [10 CFR 820.2]
135. DISCRIMINATION or DISCRIMINATORY ACTS. Discharge, demotion, reduction in pay, coercion, restraint, threats, intimidation, or other similar negative action taken against a contractor employee by a contractor, as a result of the employee's disclosure of information, participation in proceedings, or refusal to engage in illegal or dangerous activities, as set forth in § 708.5(a) of this part. [10 CFR 708.4]
136. DISPOSAL. Permanent or temporary transfer of DOE control and custody of real property to a third party who thereby acquires rights to control, use, or relinquish the property. [DOE O 430.1A]
137. DISPOSITION. Those activities that follow completion of program mission, including, but not limited to, surveillance and maintenance, deactivation, and decommissioning. [DOE O 430.1A]

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- 138. DOCKETING CLERK. The Office in DOE with which documents for an enforcement action must be filed and which is responsible for maintaining a record and a public docket for enforcement actions commencing with the filing of a Preliminary Notice of Violation. It is also the Office with which interpretations, exemptions, and any other documents designated by the Secretary shall be filed. [10 CFR 820.2]
- 139. DOCUMENT. Recorded information that describes, specifies, reports, certifies, requires, or provides data or results. A document is not considered a record until it meets the definition of record per 10 CFR 830.
- 140. DOCUMENTED SAFETY ANALYSIS. A documented analysis of the extent to which a nuclear facility can be operated safely with respect to workers, the public, and the environment, including a description of the conditions, safe boundaries, and hazard controls that provide the basis for ensuring safety. [10 CFR 830.3]
- 141. DOE ACCIDENT INVESTIGATOR. An individual who understands DOE accident investigation techniques and has experience in conducting investigations through participation in at least one Type A or Type B investigation. Effective October 1, 1998, DOE Accident Investigators must have attended an accident investigation course of instruction that is based on current materials developed by the Office of the Deputy Assistant Secretary for Oversight. [DOE O 225.1A]
- 142. DOE ACTIVITY. An activity taken for or by the DOE that has the potential to result in the occupational exposure of an individual to radiation or radioactive material. The activity may be, but is not limited to, design, construction, operation, or decommissioning. To the extent appropriate, the activity may involve a single DOE facility or operation or a combination of facilities and operations, possibly including an entire site or multiple DOE sites. [10 CFR 835.2]
- 143. DOE CONTRACTOR. Any entity under contract with DOE (or its subcontractor) that has responsibility for performing beryllium activities at DOE facilities. [10 CFR 850.3]
- 144. DOE ELEMENTS. First tier organizations at Headquarters and in the field. Field Elements include all operations offices, field offices, energy technology centers, and power marketing administrations. [DOE O 430.1A]

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145. DOE FACILITY REPRESENTATIVE. For each major facility or group of lesser facilities, an individual or his or her designee assigned responsibility by the Head of the Field/Operations Organization for monitoring the performance of the facility and its operations. This individual shall be the primary point-of-contact with the contractor and will be responsible to the appropriate Program Secretarial Officer and Head of Field/Operations Organization for implementing the requirements of the Order. [DOE O 5480.19] [EH62dd1]
146. DOE FIRE PROTECTION PROGRAM. Those fire protection requirements, hardware, administrative controls, procedures, guidelines, plans, personnel, analyses, and technical criteria that comprehensively ensure that DOE objectives relating to fire safety are achieved. [DOE O 5480.7A] [EH62dd1]
147. DOE NUCLEAR SAFETY REQUIREMENTS. The set of enforceable rules, regulations, or orders relating to nuclear safety adopted by DOE (or by another Agency if DOE specifically identifies the rule, regulation, or order) to govern the conduct of persons in connection with any DOE nuclear activity and includes any programs, plans, or other provisions intended to implement these rules, regulations, orders, a Nuclear Statute or the Act, including technical specifications and operational safety requirements for DOE nuclear facilities. For purposes of the assessment of civil penalties, the definition of DOE Nuclear Safety Requirements is limited to those identified in 10 CFR 820.20(b). [10 CFR 820.2]
148. DOE OFFICIAL. The person, or his designee, in charge of making a decision under this part. [10 CFR 820.2]
149. DOE REPRESENTATIVE. (1) A DOE employee or authorized contractor designated by the appropriate Senior Executive level management office (Headquarters, field or Operations) to work on standards committee assignments by reason of individual professional or technical expertise to further technical objectives of the Department; or (2) a DOE employee designated by the appropriate Senior Executive level management office (Headquarters, field, or Operations) to serve as official spokesperson for the Department on boards of directors governing as policy-developing bodies, including, for example, management boards of non-government standards bodies. [DOE O 1300.2A] [EH62dd1]

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150. DOSE EQUIVALENT (H). The product of absorbed dose (D) in rad (or gray) in tissue, a quality factor (Q), and other modifying factors (N). Dose equivalent is expressed in units of rem (or sievert) (1 rem = 0.01 sievert). [10 CFR 835.2]
151. DRUG CERTIFICATION. A written assurance signed by an individual with known past illegal drug involvement, as a condition for obtaining or retaining a DOE access authorization, stating that the individual will refrain from using or being involved with illegal drugs while employed in a position requiring DOE access authorization (security clearance). [10 CFR 707.4]
152. EDUCATION. The successful completion of the requirements established by an accredited educational institution. [DOE O 5480.20A] [EH62dd1]
153. EFFECTIVE DOSE EQUIVALENT (EDE). The dose equivalent from both external and internal irradiation defined by  $\sum T, W_T, X, H_T$  where  $H_T$  is the dose equivalent in tissue T and  $W_T$  is the weighing factor representing the ratio of the risk arising from irradiation of tissue T to the total risk when the whole body is irradiated uniformly. The effective dose equivalent is expressed in units of rem. [DOE O 6430.1A]
154. EFFECTIVE DOSE EQUIVALENT ( $H_E$ ). The summation of the products of the dose equivalent received by specified tissues of the body ( $H_T$ ) and the appropriate weighting factor ( $w_T$ )-that is,  $H_E = \sum w_T H_T$ . It includes the dose from radiation sources internal and/or external to the body. For purposes of compliance with 10 CFR 835, deep dose equivalent to the whole body may be used as effective dose equivalent for external exposures. The effective dose equivalent is expressed in units of rem (or sievert). [10 CFR 835.2]
155. EIGHT (8)-HOUR TIME-WEIGHTED AVERAGE (TWA) EXPOSURE LIMIT. The time-weighted average concentration in the employee's breathing zone which shall not be exceeded in any 8-hour work shift of a 40-hour workweek. [DOE O 5480.10A (Draft)]
156. ELECTRICAL TRANSMISSION AND DISTRIBUTION SYSTEMS. Include transmission lines, substation structures, systems, and components (SSCs), and control and communication SSCs. [DOE O 5480.28] [EH62dd1]

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- 157. EMERGENCY POWER SYSTEM. The auxiliary power systems that provide power to safety and security related equipment during periods of partial or total power failure of associated primary power system. [DOE O 6430.1A]
- 158. EMERGENCY POWER SYSTEM. An independent reserve source of electric energy that, upon failure or outage of the normal source, automatically provides reliable electric power within a specified time to critical devices and equipment whose failure to operate satisfactorily would jeopardize the health and safety of personnel or result in damage to property. [ANSI/IEEE STD 446-1987]
- 159. EMPLOYEE ASSISTANCE. A program of counseling, referral, and educational services concerning illegal drug use and other medical, mental, emotional, or personal problems of employees, particularly those which adversely affect behavior and job performance. [10 CFR 707.4]
- 160. EMPLOYEE CONCERN. A declaration, statement or assertion of impropriety or inadequacy associated with the environment, safety, or health aspects of DOE--managed and contractor-managed activities, the validity of which has not been established. [DOE O 5480.29] [EH62dd1]
- 161. EMPLOYEE CONCERNS MANAGER (ECM). A senior DOE Official designated as a single-point-of-contact, reporting directly to the Field Office Manager (FOM), or in Headquarters reporting to AD-1, responsible for the management of the Employee Concerns Management System (ECMS). [DOE O 5480.29] [EH62dd1]
- 162. EMPLOYEE CONCERNS REVIEW PANEL. A panel of DOE employees and specialized consultants (when appropriate) designated by the Field Office Manager and selected by the Employee Concerns Manager (ECM) for evaluation of specific concerns received by the ECM. [DOE O 5480.29] [EH62dd1]
- 163. EMPLOYEE EXPOSURE. The exposure of an employee to an airborne contaminant (as measured in the breathing zone by personal monitoring), hazardous physical agent, or harmful biological agent which would occur without correction for the protection provided by any respirator or other personal protective equipment that is in use. [DOE O 5480.10A (Draft)]
- 164. EMPLOYEE OR EMPLOYEES. Any person(s) employed by a contractor, and any person(s) previously employed by a contractor if such prior employee's

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complaint alleges that employment was terminated in violation of § 708.5. The determination of whether a person has standing as an employee shall be made without regard to the on- or off-site locale of the person's work performance. [10 CFR 708.4]

- 165. ENCLOSED VESTIBULE. A non-air-tight antechamber with an outer and anterior door for safe access through confinement barriers. The antechamber limits the air flow across confinement barriers. [EH62dd1]
- 166. ENCLOSURE. A primary confinement system such as process systems, glove boxes, conveyors, hot cells, and canyons. [DOE O 6430.1A]
- 167. ENERGY. The capacity to do work. Energy exists in many forms, including acoustic, potential, electrical, kinetic, thermal, biological, chemical and radiation (both ionizing and non-ionizing). [DOE G 225.1A-1]
- 168. ENERGY FLOW. The transfer of energy from its source to some other point. There are two types of energy flows: wanted (controlled--able to do work) and unwanted (uncontrolled--able to do harm). [DOE G 225.1A-1]
- 169. ENFORCEMENT ADJUDICATION. The portion of the enforcement process that commences when a respondent requests an on-the-record adjudication of the assessment of a civil penalty and terminates when a Presiding Officer files an initial decision. [10 CFR 820.2]
- 170. ENGINEERED CONTROLS. Physical controls, including set points and operating limits; as distinct from administrative controls. [ISMS Guide]
- 171. ENGINEERED SAFETY FEATURES. Means systems, components, or structures that prevent and/or mitigate the consequences of potential accidents described in the Final Safety Analysis Report including the bounding design basis accidents. [DOE O 5480.23] [EH62dd1]
- 172. ENSURE. As used in DOE M 411.1-1, "to ensure" means that normal supervision is to be employed to confirm to the ensuring organization's satisfaction that a condition is being met or an activity is being properly conducted. The degree of rigor to be employed by the ensuring organization should depend upon the history of supervision of the performing organization.



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173. ENTRANCE OR ACCESS POINT. Any location through which an individual could gain access to areas controlled for the purposes of radiation protection. This includes entry or exit portals of sufficient size to permit human entry, irrespective of their intended use. [10 CFR 835.2]
174. ENVIRONMENTAL PROTECTION STANDARD. A specified set of rules or conditions concerned with delineation of procedures; definition of terms; specification of performance, design, or operations; or measurements that define the quantity of emissions, discharges, or releases to the environment and the quality of the environment.
175. ENVIRONMENTAL QUALIFICATION. Used to ensure that safety-class structures, systems, and components can perform all safety functions, as determined by the safety analysis, with no failure mechanism that could lead to common cause failures under postulated service conditions. The requirements from American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE) Standard 323 for mild environments shall be used unless the environment in which the structure, system, or component is located changes significantly as a result of the design basis accidents. In general, qualification for mild environments should consist of two elements:
- A. Ensuring that all equipment is selected for application to the specific service conditions based on sound engineering practices and manufacturers' recommendations.
  - B. Ensuring that the system documentation includes controls that will preserve the relationship between equipment application and service conditions.
174. ENVIRONMENTAL RESTORATION ACTIVITIES. The process(es) by which contaminated sites and facilities are identified and characterized and by which contamination is contained, treated, or removed and disposed. [10 CFR 830.3]
- [DOE G-420.1-X]
176. EQUIPMENT. The systems and devices used throughout DOE and commonly referred to as equipment are divided into three categories for the purpose of this Order. It is the intent of this definition to separately identify the installed equipment that can logically be considered as an integral part of a real property

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improvement from other types of equipment. The purpose of such a determination is to provide a uniform basis for analysis of various maintenance and repair costs.

- A. **INSTALLED EQUIPMENT.** This category includes the mechanical and electrical systems that are installed as part of basic building construction and are essential to the normal functioning of the facility and its intended use. Examples are heating, ventilating, and air conditioning (HVAC) systems; elevators; and communications systems.
  - B. **PROGRAMMATIC EQUIPMENT.** Equipment (both real and personal) dedicated for a specific programmatic use. Examples are accelerators, microscopes, radiation detection equipment, glove boxes, and hotcells.
  - C. **OTHER EQUIPMENT.** Some examples in this category are office machines, vehicles and mobile equipment, helicopters, airplanes, and computers and other automated data-processing equipment. [DOE O 4330.4B] [EH62dd1]
177. **EQUIPMENT QUALIFICATION.** The generation and maintenance of evidence to assure that equipment will operate on demand to meet the system performance requirements for the conditions that the equipment is required to operate. [DOE O 5480.EIA] [EH62dd1]
178. **EQUIVALENCY.** The approved alternate means of satisfying the technical provisions of a fire protection code or standard. (Deviations from specific requirements of occupational safety and health standards, as delineated in the Code of Federal Regulations, are treated as variances.) [EH62dd1]
179. **EVALUATION GUIDELINES.** Hazardous material dose/exposure values that the safety analysis evaluates against. The intention is that theoretical individual doses/exposures exceeding the Evaluation Guideline should not occur at a given point, unlike other values, such as emergency planning thresholds. Offsite Evaluation Guidelines are established for the purpose of identifying and evaluating safety-class structures, systems, and components. Onsite Evaluation Guidelines are not required for adequate documentation of a safety basis utilizing the overall process of DOE-STD-3009-94. [DOE-STD-3009-94]
180. **EVENT.** Something significant and real-time that happens (e.g., pipe break, valve failure, loss of power, environmental spills, earthquake, tornado, flood). [DOE M 232.1-1A]

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181. EVENTS AND CAUSAL FACTORS CHART. Graphical depiction of a logical series of events and related conditions that precede the accident. [DOE G 225.1A-1]
182. EXCEPTION. A release from the specific requirements of this Order. Exception also refers to release of an individual from portions of a training program through prior education, experience, training, and/or testing. [DOE O 5480.20A]
183. EXEMPTION. The final order that sets forth the relief, waiver, or release, either temporary or permanent, from a DOE Nuclear Safety Requirement, as granted by the appropriate Secretarial Officer pursuant to the provisions of subpart E of this part. [10 CFR 820.2]
184. EXPANDED HEALTH STANDARD. Any standard promulgated by the U.S. Occupational Safety and Health Administration under Section 6(b)(5) of the U.S. Occupational Safety and Health Act of 1970. Expanded health standards generally address a specific substance and include, in addition to a permissible exposure limit, ancillary requirements pertaining to medical surveillance, exposure monitoring, personal protective equipment, respiratory protection, training and information, and record keeping. [DOE O 5480.10A (Draft)]
185. EXPLOSIVE. Any chemical compound or mechanical mixture that, when subjected to heat, impact, friction, shock, or other suitable initiation stimulus, undergoes a very rapid chemical change with the evolution of large volumes of highly heated gases that exert pressures in the surrounding medium. The term applies to materials that either detonate or deflagrate. DOE explosives may be dyed various colors, except pink, which is reserved for mock explosives. [DOE M 440.1-1]
186. EXPLOSIVES ACTIVITY. Each function (storage, handling, and processing) involving explosives from the manufacture or receipt of the explosives through the final shipping configuration, including final storage, but excluding the movement of explosives between explosives areas. [DOE O 6430.1A]
187. EXPLOSIVES BAY. A location (room, cubicle, cell, work area) containing a single type of explosives activity that affords the requirement protection for the appropriate hazard classification (Class I, II, III, or IV as defined below) of the explosives activity involved. Examples of such explosives activities are

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machining, pressuring, meltcasting, nondestructive testing, and assembly operations. [DOE O 6430.1A]

188. EXPLOSIVES BUILDING. Any structure containing one or more explosives bays. [DOE O 6430.1A]
189. EXPLOSIVES HAZARD CLASSES. The level of protection required for any specific explosives activity, based on the hazard class (accident potential) for the explosives activity involved. Four hazard classes are defined for explosives activities as follows in definitions for explosives hazard classes I-IV. [DOE O 6430.1A]
190. EXPLOSIVES HAZARD, CLASS I. Class I consists of those explosives activities involving a high potential for an accident that is unacceptable for the exposure of any personnel, thus requiring remote operations. In general, this would include activities where the energies that may interface with the explosives are approaching the upper limits of safety, and/or loss of control of the energy is likely to exceed the safety limits for the explosives involved. This category includes those research and development activities where the safety implications have not been fully characterized. Examples of Class I activities are screening, blending, pressing, extrusion, drilling of holes, dry machining, some wet machining, machining explosives and metal in combination, development of some new explosives or explosives processing methods, and explosives disposal. [DOE O 6430.1A]
191. EXPLOSIVE HAZARD, CLASS II. Class II consists of those explosives activities that involve a moderate Potential for an accident because of the type of explosives, the conditions of the explosives and/or the nature of the operations involved. This category consists of activities where the accident potential is greater than Class III but the exposure of personnel performing contact operations is acceptable. Included are activities where the energies that do or may interface with the explosives are normally well within the safety boundaries for the explosives involved, but where the loss of control of these energies might approach the safety limits of the explosives. Examples of Class II activities involving HE are weighing, some wet machining, assembly and disassembly, and environmental testing (exposure of explosives samples to variations in temperature, humidity, etc.). It should be noted that some environmental testing is a Class I (remote) activity (e.g., heating an explosives sample to within 10°C of its critical temperature). [DOE O 6430.1A]

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192. EXPLOSIVES HAZARD, CLASS III. Class III consists of those explosives activities that represent a low potential for an accident because of the type of explosives, the conditions of the explosives and/or the nature of the activity involved. Class III includes explosives activities where the accident potential of the operation being performed is not significantly different from explosives storage. Examples are normal handling, storage, packaging, unpackaging, and some inspection and nondestructive testing. [DOE O 6430.1A]
193. EXPLOSIVES HAZARD, CLASS IV. Class IV consists of those explosives activities with insensitive high explosives (IHE) or IHE subassemblies that, although mass detonating, are so insensitive that there is negligible probability for accidental initiation or transition from burning to detonation. Explosions will be limited to pressure ruptures of containers heated in a fire. Although the fire hazards of IHE or IHE subassemblies are not as great as those of other explosives, it is classified as hazard class/division 1.3 (mass fire) to be consistent with DOD 6055.9. Most processing and storage activities with IHE and IHE subassemblies are Class IV. However, the following are examples of explosive activities with IHE or IHE subassemblies that remain Class I: pressing, some machining (see DOE/EV 06194), dry blending, dry milling, and dry screening. [DOE O 6430.1A]
194. EXPOSURE ASSESSMENT (EA). The estimation or determination (qualitative or quantitative) of the magnitude, frequency, duration, and route of employee exposure to a substance, harmful physical agent, ergonomic stress, or harmful biological agent that poses or may pose a recognized hazard to the health of employees. [DOE O 5480.10A (Draft)]
195. EXPOSURE ASSESSMENT(EA). The systematic collection and analysis of occupational hazards and exposure determinants such as work tasks; magnitude, frequency, variability, duration, and route of exposure; and the linkage of the resulting exposure profiles of individuals and similarly exposed groups for the purposes of risk management and health surveillance. [DOE G 440.1-3]
196. EXTERNAL DOSE OR EXPOSURE. That portion of the dose equivalent received from radiation sources (e.g., “external sources”) outside the body. [10 CFR 835.2]
197. EXTERNAL EVENTS. Natural phenomena or man-caused hazards not related to the facility. [ISMS Guide]

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198. EXTREMITY. Hands and arms below the elbow or feet and legs below the knee. [10 CFR 835.2]
199. FACILITIES. Land, buildings, and other structures, their functional systems and equipment, and other fixed systems and equipment installed therein, including site development features outside the plant, such as landscaping, roads, walks, and parking areas; outside lighting and communication systems; central utility plants; utilities supply and distribution systems; and other physical plant features. [DOE O 430.1A]
200. FACILITY. Any equipment, structure, system, process, or activity that fulfills a specific purpose. Facilities do not have to be structures. Examples include accelerators, storage areas, fusion research devices, nuclear reactors, production or processing plants, coal conversion plants, magnetohydrodynamics experiments, windmills, radioactive waste disposal systems and burial grounds, environmental restoration activities, testing laboratories, research laboratories, transportation activities, and accommodations for analytical examinations of irradiated and unirradiated components. [DOE Glossary] [ISMS Guide]
201. FACILITY. The buildings, utilities, structures, and other land improvements associated with an operation or service and dedicated to a common function. [DOE O 430.1A]
202. FACILITY BOUNDARY. The fence or other barrier that surrounds and prevents uncontrolled access to the nuclear facility or facilities. [DOE O 5480.30] [EH62dd1]
203. FACILITY MANAGER. That individual, or designee, usually but not always a contractor, with direct line responsibility for operation of a facility or group of related facilities, including authority to direct physical changes to the facility. [DOE M 232.1-1A]
204. FACILITY SHUTDOWN. (1) The situation in which a reactor is taken subcritical either manually or automatically to a safe shutdown condition, or (2) the condition in which a nonreactor nuclear facility ceases operations for which the facility was being operated and is placed in a safe condition (i.e., program work ceases). In a shutdown condition, a facility must still meet all applicable technical safety requirements and environmental, safety, and health requirements. [DOE O 5480.31]

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- 205. FIELD ELEMENT. A non-Headquarters DOE organization that is geographically distinct. Field elements can be area offices, support offices, operations offices, field offices; regional offices, or offices located at environmental restoration, construction, or termination sites.
- 206. FIELD/OPERATIONS OFFICE MANAGER. A DOE individual with management responsibility for a field/Operations organization. The field/Operations Office Manager is responsible for the management, coordination, and administration of operations under his or her purview and reports to the cognizant Secretarial Officer(s) through the appropriate program office(s). (This definition also applies to other self-supporting DOE offices, such as the Rocky Flats Office, Superconducting Super Collider Project Office, and Strategic Petroleum Reserve Project Office.) [DOE O 5480.29] [EH62dd1]
- 207. FIELD ORGANIZATION. A DOE field-based office that is responsible for the management, coordination, and administration of operations under its purview. [10 CFR 708.4]
- 208. FIELD PROGRAM MANAGER (FPM). A DOE senior official who is responsible for the onsite management and supervision of DOE staff and facilities. This official also provides guidance to contractors and oversees their activities. The FPM reports to the field/Operations office and is accountable to the appropriate Secretarial Officer, as defined in management agreements. [EH62dd1]
- 209. FIELD VALIDATION. Process of providing reasonable assurance that design requirements are properly reflected in the physical plant and in the associated documentation. Field validation tests the strength of the bonds in the basic configuration management model (i.e., between design requirements, the physical configuration, and the configuration documentation). [EH62dd1]
- 210. FILING. Except as otherwise specifically indicated, the completion of providing a document to the Office of the Docketing Clerk and serving the document on the person to whom the document is addressed. [10 CFR 820.2]
- 211. FINAL NOTICE OF VIOLATION. A document issued by the Director in which the Director determines that the respondent has violated or is continuing to violate a DOE Nuclear Safety Requirement and includes:

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- (i) A statement specifying the DOE Nuclear Safety Requirement to which the violation relates;
- (ii) A concise statement of the basis for the determination;
- (iii) Any remedy, including the amount of any civil penalty;
- (iv) A statement explaining the reasoning behind any remedy; and
- (v) If the Notice assesses a civil penalty, notice of respondent's right:
  - (A) To waive further proceedings and pay the civil penalty;
  - (B) To request an on-the-record adjudication of the assessment of the civil penalty; or
  - (C) To seek judicial review of the assessment of the civil penalty.

[10 CFR 820.2]

- 212. FINAL ORDER. An order of the Secretary that represents final agency action and, where appropriate, imposes a remedy with which the recipient of the order must comply. [10 CFR 820.2]
- 213. FINAL SAFETY ANALYSIS REPORT (FSAR). The Safety Analysis Report (SAR) submitted to and approved by DOE prior to the authorization to operate a new nuclear facility or that documents the adequacy of the safety analysis for an existing nuclear facility.
- 214. FIRE AREA. A location bounded by construction having a minimum fire resistance rating of 2 hours with openings protected by appropriately fire-rated doors, windows, dampers, or penetration seals. The boundaries or exterior fire areas (yard areas) or other locations that represent unique conditions should be as determined by the cognizant fire protection engineer (contractor or DOE). [DOE-STD-1066-97]
- 215. FIRE BARRIER. A continuous membrane, either vertical or horizontal, such as a wall or floor assembly that is designed and constructed with a specified fire



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resistance rating to limit the spread of fire and that also will restrict the movement of smoke. Such barriers may have protected openings.

216. FIRE HAZARDS ANALYSIS. An assessment of the risks from fire within an individual fire area in a DOE nuclear facility analyzing the relationship to existing or proposed fire protection. This shall include an assessment of the consequences of fire on safety systems and the capability to safely operate a facility during and after a fire. [DOE O 5480.30] [EH62dd1]
217. FIRE LOSS. The dollar cost of restoring damaged property to its pre-fire condition. When determining loss, the estimated damage to the facility and contents should include replacement cost, less salvage value. Fire loss should exclude the costs for:
  - A. property scheduled for demolition; and
  - B. decommissioned property not carried on books as a value.
  - C. Fire loss should include the cost of:
  - D. decontamination and cleanup;
  - E. the loss of production or program continuity;
  - F. the indirect costs of fire extinguishment (such as damaged fire department equipment); and
  - G. the effects on related areas. [DOE-STD-1066-97]
218. FIRE PROTECTION. A broad term which encompasses all aspects of fire safety, including: building construction and fixed building fire features, fire suppression and detection systems, fire water systems, emergency process safety control systems, emergency fire fighting organizations (fire departments, fire brigades, etc.), fire protection engineering, and fire prevention. Fire protection is concerned with preventing or minimizing the direct and indirect consequences of fire. It also includes aspects of the following perils as they relate to fire protection: explosion, earthquake, lightning, smoke, and water damage from fire. [DOE O 5480.7A] [EH62dd1]

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- 219. FIRE PROTECTION SYSTEM. Any system designed to detect and contain or extinguish a fire, as well as limit the extent of fire damage and enhance life safety. [DOE-STD-1066-97]
- 220. FIRE RESISTANCE RATING. The time that a particular construction will withstand a standard fire exposure in hours as determined by American Society of Testing and Materials standard ASTM E-119. [DOE-STD-1066-97]
- 221. FISSIONABLE MATERIALS. A nuclide capable of sustaining a neutron-induced fission chain reaction (e.g., uranium-233, uranium-235, plutonium-238, plutonium-239, plutonium-241, neptunium-237, americium-241, and curium-244). [10 CFR 830.3]
- 222. FISSIONABLE MATERIALS HANDLER. A person certified by contractor facility management to manipulate or handle significant quantities of fissionable materials, or manipulate the controls of equipment used to produce, process, transfer, store, or package significant quantities of such materials. [DOE O 5480.20A] [EH62dd1]
- 223. FLAME SPREAD RATING. Flame spread rating is a numerical classification determined by the test method in American Society of Testing and Materials standard ASTM E-84, which indexes the relative burning behavior of a material by quantifying the spread of flame of a test specimen. The surface burning characteristic of a material is not a measure of resistance to fire exposure. [DOE-STD-1066-97]
- 224. FLAMMABLE LIQUID. A liquid having a closed cup flash point below 100°F (38°C) and having a vapor pressure not exceeding 40 psia (2068 mm Hg) at 100°F (38°C). [DOE-STD-1066-97]
- 225. “FLOOR-LEVEL” PROCEDURES. Detailed instructions used by technicians, researchers, and other workers to directly accomplish work activities or tasks. [DNFSB mandated] [ISMS Guide]
- 226. FULL-SCOPE SIMULATOR. A simulator incorporating detailed modeling of systems of the reference facility with which the operator interface in the control room environment. The control room operating consoles are included. Such a simulator demonstrates expected facility response to normal and abnormal conditions. [DOE Glossary and DOE O 5480.20A]

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- 227. FUNCTION. An action or activity undertaken by a DOE employee in performing or contributing to performance of work in compliance with component 3 of DOE P 450.4, SAFTY MANAGEMENT POLICY. This component defines five core functions for integrated safety management, each of which includes several derivative functions which are to be applied with a degree of rigor appropriate to the type of activity and hazards involved. [DOE M 411.1-1A]
- 228. FUNCTION. The capability of structures, systems, and components to perform their intended mission. Maintaining function after a natural phenomena hazard (NPH) occurrence is required by DOE O 4330.4A for structures, systems, and components important to safety, and to minimize property losses based on cost benefit considerations. Maintaining function such that programmatic objectives are achieved is not required by this Order, but is commonly a goal for NPH design and evaluation. [DOE O 4330.4A] [EH62dd1]
- 229. FUNCTIONAL UNIT. A logical and systematic group of property that is necessary to support the site mission. A functional unit must be described in a breakdown structure for each site in order that it be properly identified and managed. Functional units will vary in size and scope within sites and from site to site, depending on the type or types of activities being carried out. A functional unit will often comprise a total facility (e.g., laboratory, production plant, or utility), but may also be a portion of a facility (e.g., production line, shop, clean room, or tooling). A functional unit is the basic entity for justifying individual projects and must be auditable in terms of mission requirements or performance standards. [DOE O 4330.4A] [EH62dd1]
- 230. GENERAL COUNSEL. The General Counsel of DOE or his designee. [10 CFR 820.2]
- 231. GENERAL EMPLOYEE. An individual who is either a DOE or DOE contractor employee; an employee of a subcontractor to a DOE contractor; or a visitor who performs work for or in conjunction with DOE or utilizes DOE facilities. [10 CFR 835.2]
- 232. GOVERNMENT STANDARDS. Federal, military, and other agency standards and specifications developed by Federal agency personnel, outside groups under agency regulations, or by organization or committees made up solely of Government-agency representatives. [DOE O 1300.2A] [EH62dd1]

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233. GRADED APPROACH. The process of assuring that the level of analysis, documentation, and actions used to comply with a requirement in 10 CFR 830 are commensurate with:
- A. The relative importance to safety, safeguards, and security;
  - B. The magnitude of any hazard involved;
  - C. The life cycle stage of a facility;
  - D. The programmatic mission of a facility;
  - E. The particular characteristics of a facility;
  - F. The relative importance of radiological and nonradiological hazards; and
  - G. Any other relevant factor.

[10 CFR 830.3]

234. GRADED APPROACH. The depth of detail required and the magnitude of resources expended for a particular management element to be tailored to be commensurate with the element's relative importance to safety, environmental compliance, safeguards and security, programmatic importance, magnitude of the hazard, financial impact, and/or other facility-specific requirements. [DOE O 430.1A]
235. GUIDING PRINCIPLES. Conditions for performance of work that a Safety Management System must address. The guiding principles for the Safety Management System Policy (DOE P 450.4) are *Line Management Responsibility for Safety, Clear Roles and Responsibilities, Competence Commensurate with Responsibilities, Balanced Priorities, Identification of Safety Standards and Requirements, Hazard Controls Tailored to Work Being Performed and Operations Authorization*. These principles are also identified in DEAR 48 CFR 970.5204-2(b). [Extrapolated from DOE P 450.4] [ISMS Guide]
236. HARSH ENVIRONMENT. Air environment where service conditions are expected to exceed the mild environment conditions as a result of design basis

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accidents, fires, explosions, natural phenomena or other man-caused external events. [DOE O 5480.EIA] [EH62dd1]

237. HAZARD. A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel or damage to a facility or to the environment (without regard to the likelihood or credibility of accident scenarios or consequence mitigation). [10 CFR 830.3]
238. HAZARD ANALYSIS. The determination of material, system, process, and plant characteristics that can produce undesirable consequences, followed by the assessment of hazardous situations associated with a process or activity. Largely qualitative techniques are used to pinpoint weaknesses in design or operation of the facility that could lead to accidents. The safety analysis report hazard analysis examines the complete spectrum of potential accidents that could expose members of the public, onsite workers, facility workers, and the environment to hazardous materials. [DOE-STD-3009-94]
239. HAZARD CATEGORIES. The consequences of unmitigated releases of radioactive and/or hazardous material are evaluated as required by DOE 5480.23 and classified by the following hazard categories:
- A. CATEGORY 1. The hazard analysis shows the potential for significant offsite consequences.
  - B. CATEGORY 2. The hazard analysis shows the potential for significant onsite consequences.
  - C. CATEGORY 3. The hazard analysis shows the potential for only significant localized consequences. [DOE O 5480.31] [EH62dd1]
240. HAZARD CLASSES. Non-nuclear facilities will be categorized as high, moderate, or low hazards based on the following:
- A. High - hazards with a potential for onsite and offsite impacts to large numbers of persons or for major impacts to the environment;
  - B. Moderate - hazards which present considerable potential onsite impacts to people or the environment, but at most only minor offsite impacts, and;

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- C. Low - hazards which present minor onsite and negligible offsite impacts to people and the environment.

[DOE O 5481.1B]

- 241. HAZARDS CONTROLS. Measures to eliminate, limit, or mitigate hazards to workers, the public, or the environment, including
  - A. Physical, design, structural, and engineering features;
  - B. Safety structures, systems, and components;
  - C. Safety management programs;
  - D. Technical Safety requirements; and
  - E. Other controls necessary to provide adequate protection from hazards.

[10 CFR 830 3]

- 242. HAZARDOUS EXPOSURE. Exposure, including potential exposure, to any toxic substance, harmful physical agent, ergonomic stress, or harmful biological agent that poses or may pose a recognized hazard to the health of employees. [DOE O 5480.10A (Draft)]
- 243. HAZARDOUS EXPOSURE. Exposure to any toxic substance, harmful physical agent, ergonomic stressor, or harmful biological agent that poses a recognized hazard to the health of employees. [DOE G 440.1-3]
- 244. HAZARDOUS MATERIAL. Any material subject to the placarding requirements of 49 CFR 172.504, table 1, and materials presenting a poison-inhalation hazard that must be placarded under the provisions of 49 CFR 172.505. [10 CFR 707.4]
- 245. HAZARDOUS MATERIALS. Those materials that are toxic, explosive, flammable, corrosive, or otherwise physically or biologically threatening to health. [DOE IG-420.1.4]
- 246. HAZARDOUS SUBSTANCE:

U.S. DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIALS (See 49 CFR 171.8 and 172.101). A substance or material, including a hazardous substance which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated.

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U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) HAZARDOUS SUBSTANCES (See 40 CFR 302 and 40 CFR 117). For purposes of transportation, see 49 CFR 171.8 and 172.101.

EPA HAZARDOUS WASTES (See 40 CFR 261 and 40 CFR 262). Any material that is subject to the Hazardous Waste Manifest Requirements of EPA specified in 40 CFR 261. For purposes of transportation, see 49 CFR 171.8.

U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION HAZARDOUS CHEMICAL (See 29 CFR 1900.1000 and 29 CFR 1910.1200). Any chemical which is a physical hazard or a health hazard.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT EXTREMELY HAZARDOUS SUBSTANCES (See 40 CFR 355). These are not defined, but appear on a list in Appendix A and B of 40 CFR 355. [DOE O 5000.3B] [EH62dd1]

247. HAZARDOUS WASTE. A solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may—
- A. cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
  - B. pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed or, or otherwise managed. [Pub Law 98-616]
248. HEAD OF FIELD ELEMENT. An individual who is the manager or head of a DOE operations office, other field office, or field organization. [10 CFR 708.4]
249. HEAD OF THE CONTRACTING ACTIVITY. Head of a Departmental element who has been delegated authority by the Deputy Assistant Secretary for Procurement and Assistance Management to award and administer contracts, sales contracts, and/or financial assistance instruments; appoint contracting officers; and exercise the overall responsibility for managing the contracting activity. [DOE Glossary] [ISMS Guide]
250. HEADS OF HEADQUARTERS ELEMENTS. Senior program managers within a line organizational structure. For purpose of this Order, these positions include the

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Assistant Secretaries for Conservation and Renewable Energy, Defense Programs, Fossil Energy, and Nuclear Energy, and the Directors of Energy Research, Civilian Radioactive Waste Management, and Environmental Restoration and Waste Management. Also included are the Administrators of the Bonneville and Western Area Power Administrations. [DOE O 4330.4B] [EH62dd1]

- 251. HEALTH HAZARD ASSESSMENT. The comprehensive and systematic process of identifying, classifying, and evaluating health hazards in the workplace. Health hazard assessments evaluate the probability and severity of the effects of exposure to the hazard. [DOE O 5480.10A (Draft)]
- 252. HEALTH SURVEILLANCE. The continuing scrutiny of health events to detect changes in disease trends or disease distribution. The continuing collection and maintenance of industrial hygiene data is a component of health surveillance needed to determine whether observed adverse health events are related to working conditions. [DOE O 5480.10A (Draft)]
- 253. HEARING. An on-the-record enforcement adjudication open to the public and conducted under the procedures set forth in subpart B of this part. [10 CFR 820.2]
- 254. HEARING OFFICER. An individual appointed by the Director, Office of Hearings and Appeals, pursuant to § 708.9. Management and Operating Contract means an agreement under which DOE contracts for the operation, maintenance, or support, on its behalf, of a Government-owned or -leased research, development, special production, or testing establishment wholly or principally devoted to one or more of the programs of DOE. [10 CFR 708.4]
- 255. HEAT RESISTANT. A material having the quality or capability of withstanding heat for a specified period at a maximum given temperature without decomposing or losing its integrity. [DOE-STD-1066-97]
- 256. HIGH-LEVEL WASTE (HLW). The highly radioactive material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid waste derived from the liquid, that contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation. [DOE G 460.2-1]
- 257. HIGH-LEVEL WASTE. High-level waste is the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid



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waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with the existing law, to require permanent isolation. [Adapted from: Nuclear Waste Policy Act of 1982, as amended] [DOE M 435.1-1]

- 258. HIGH CONTAMINATION AREA. Any area, accessible to individuals, where removable surface contamination levels exceed or are likely to exceed 100 times the removable surface contamination values specified in appendix D of this part. [10 CFR 835.2]
- 259. HIGH-EFFICIENCY PARTICULATE AIR (HEPA) FILTER. A filter capable of trapping and retaining at least 99.97 percent of 0.3 micrometer monodispersed particles. [10 CFR 850.3]
- 260. HIGH EXPLOSIVES (HE). Explosive substances capable of mass detonation, and for which there is a significant probability of accidental initiation or transition from burning to detonation. [DOE O 6430.1A]
- 261. HIGH-LEVEL WASTE. High-level waste is the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation. [Adapted from: Nuclear Waste Policy Act of 1982, as amended] [DOE M 435.1-1]
- 262. HIGH RADIATION AREA. Any area, accessible to individuals, in which radiation levels could result in an individual receiving a deep dose equivalent in excess of 0.1 rem (0.001 sievert) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates. [10 CFR 835.2]
- 263. HOLDUP (NUCLEAR MATERIAL). Holdup is the nuclear material that is retained in process equipment at inventory time. [DOE O 6430.1A]
- 264. HUMAN FACTORS. Those biomedical, psychosocial, workplace environment, and engineering considerations pertaining to people in a human-machine system. Some of these considerations are allocation of functions, task analysis, human reliability, training requirements, job performance aiding, personnel qualification

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and selection, staffing requirements, procedures, organizational effectiveness, and workplace environmental conditions. [DOE O 5480.30] [EH62dd1]

265. HUMAN FACTORS ENGINEERING. The application of knowledge about human performance capabilities and behavioral principles to the design, operation, and maintenance of human-machine systems so that personnel can function at their optimum level of performance. [DOE O 5480.30]. [EH62dd1]
266. ILLEGAL DRUG. A controlled substance, as specified in Schedules I through V of the Controlled Substances Act, 21 U.S.C. 811, 812. The term “illegal drugs” does not apply to the use of a controlled substance in accordance with terms of a valid prescription, or other uses authorized by law. [10 CFR 707.4]
267. IMMUNE RESPONSE. The series of cellular events by which the immune system reacts to challenge by an antigen. [10 CFR 850.3]
268. IMPLEMENTATION PLAN. A document prepared by a contractor that sets forth:
- A. When and how the actions appropriate to comply with the requirements of a section of 10 CFR 830, including the requirements of a plan or program required by the section, shall be taken, and
  - B. What relief will be sought if a contractor cannot attain full compliance with a requirement in a reasonable manner. [10 CFR 830.3]
269. IMPORTANT TO SAFETY. Any equipment or components whose function can impact safety either directly or indirectly. This includes safety and non-safety class equipment, and, in some instances, balance-of-plant equipment. [DOE O 5480.21] [EH62dd1]
270. IMPROVED RISK (FIRE PROTECTION). Property protection which reduces risk to such a level that would qualify for complete insurance coverage by the Factory Mutual System, the industrial risk insurers, or other industrial insurance companies that limit their insurance underwriting to the best protected class of industrial risk. [DOE O 6430.1A]
271. IN-PROCESS OR IN-USE MATERIAL. Material that is integral to the manufacturing or production processes and is needed to maintain continuity of operations. Other material that requires temporary location near the pertinent

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process areas in readiness for near-term use or for movement to other process areas may also be considered "in-process." For material involved in laboratory operations, analogous definitions shall be applied to determine eligibility for the "in-process" or "in-use" category and consequent exclusion from storage requirements of these criteria. [DOE O 6430.1A]

- 272. INDIVIDUAL. Any human being. [10 CFR 835.2]
- 273. INDUSTRIAL HYGIENE. The science and art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses arising in or from the workplace that may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers. [DOE O 5480.10A (Draft)]
- 274. INDUSTRIAL HYGIENE SURVEY. An evaluation of workplaces, operations, and controls to identify and determine the existence and extent of hazardous or potentially hazardous exposures and to identify exposed and potentially exposed employees. At a minimum, the survey consists of an inspection of the workplace to determine conformance with Department of Energy-prescribed industrial hygiene requirements, observation of the work operation, and appropriate monitoring as required by this Order to measure the hazardous or potentially hazardous exposure of employees. [DOE O 5480.10A (Draft)]
- 275. INDUSTRIAL HYGIENIST. A person having a college or university degree or degrees in engineering, chemistry, physics, or medicine or related biological sciences who, by virtue of special studies and training, has acquired competence in Industrial Hygiene. Such special studies and training must have been sufficient in all of the above cognate sciences to provide the abilities:
  - A. to recognize the environmental factors and stresses associated with work and work operations and to understand their effect on people and their well being;
  - B. to evaluate, on the basis of experience and with the aid of quantitative measurement techniques, the magnitude of these stresses in terms of ability to impair an individual's health and well being; and
  - C. to prescribe methods to eliminate, control or reduce such stresses when necessary to alleviate their effects. (See the Bulletin of the American Board of Industrial Hygiene for additional details.)

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[DOE O 5480.10A (Draft)]

- 276. INHABITED-BUILDING DISTANCE. The minimum distance permitted between explosives locations and inhabited buildings, administrative areas, site boundaries, main power stations, and other facilities of a vital or strategic nature. [DOE M 440.1-1]
- 277. INITIAL DECISION. The decision filed by the Presiding Officer based upon the record of the enforcement adjudication out of which it arises. [10 CFR 820.2]
- 278. INITIAL STARTUP. Those activities that follow preoperational testing, involving all actions taken, including tests to assure a safe, orderly, incremental approach to predefined conditions of operation. [DOE O 5480.6]
- 279. INSTALLED LIFE. The time interval from installation to removal, during which the equipment or component thereof may be subject to design service conditions and system demands. [DOE O 5480.EIA] [EH62dd1]
- 280. INTEGRATED SAFETY MANAGEMENT SYSTEM. A Safety Management System to systematically integrate safety into management and work practices at all levels as required by DOE P 450.4, SAFETY MANAGEMENT SYSTEM POLICY. [ISMS Guide]
- 281. INTERAGENCY COMMITTEE ON STANDARDS POLICY. A committee established under the auspices of the Department of Commerce to coordinate and provide policy guidance to the heads of Federal agencies on standards. It is comprised of representatives from the major Federal departments and agencies which have an interest in standards. The Committee is chaired by the Director, Office of Standards Services, National Institute of Standards and Technology. [DOE O 1300.2A] [EH62dd1]
- 282. INTERNAL DOSE OR EXPOSURE. That portion of the dose equivalent received from radioactive material taken into the body (e.g., "internal sources"). [10 CFR 835.2]
- 283. INTERPRETATION. A statement by the General Counsel concerning the meaning or effect of the Act, a Nuclear Statute, or a DOE Nuclear Safety Requirement which relates to a specific factual situation but may also be a ruling

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of general applicability where the General Counsel determines such action to be appropriate. [10 CFR 820.2]

- 284. ITEM. An all-inclusive term used in place of any of the following: appurtenance, assembly, component, equipment, material, module, part, product, structure, subassembly, subsystem, system, unit, or support systems. [10 CFR 830.3]
- 285. JOB ANALYSIS. A systematic method used in obtaining a detailed listing of the tasks of a specific job. [DOE O 5480.20A] [EH62dd1]
- 286. JUDGEMENTS OF NEED. Managerial controls and safety measures necessary to prevent or minimize the probability or severity of a recurrence of an accident. [DOE O 225.1A]
- 287. LABELED. That equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization acceptable to the cognizant DOE authority for fire protection concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner. [DOE O 5480.30] [EH62dd1]
- 288. LANDLORD. A Head of a Headquarters element with overall capital improvement and common support responsibility for a site; also represents the various Headquarters interests at the site. [DOE O 4330.4A] [EH62dd1]
- 289. LANDLORD PROGRAM OFFICE. (Landlord) The Headquarters Program Office responsible for the support, planning, acquisition, operation, maintenance, and disposition of physical assets related to infrastructure. [DOE O 430.1A]
- 290. LEAD PROGRAM OFFICE. At multiprogram sites, that Headquarters program office assuming responsibility for ensuring that safety management direction and funding are coordinated among all program offices involved.
- 291. LENS OF THE EYE DOSE EQUIVALENT. The external exposure of the lens of the eye and is taken as the dose equivalent at a tissue depth of 0.3 cm. [10 CFR 835.2]
- 292. LIFE CYCLE. The life of an asset from planning through acquisition, maintenance, operation, and disposition. [DOE O 430.1A] [ISMS Guide]

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- 293. LIFE-CYCLE PLAN. An analysis and description of the major events and activities in the life of a functional unit from planning through decommissioning and site restoration. The plan documents the history of the functional unit and forecasts future activities, including major line item and expense projects and their duration, relationships, and impact on life expectancy. The plan also describes maintenance practices and costs. [DOE O 4330.4B] [EH62dd1][DOE Glossary]
- 294. LIMITED SUPPLY SUPPRESSION SYSTEM. A system installed in accordance with the applicable National Fire Protection Association (NFPA) Standards and having a limited quantity of suppression agent. These systems typically include carbon dioxide, dry chemical, other gaseous agent, or water. [DOE-STD-1066-97]
- 295. LIMITING CONDITIONS FOR OPERATION (LCO). The lowest functional capability or performance level of safety structures, systems, and components and their support systems required for normal, safe operation of a facility. [DOE O 5480.22]
- 296. LIMITING CONDITIONS FOR OPERATION. The limits that represent the lowest functional capability or performance level of safety structures, systems, and components required for safe operations. [10 CFR 830.3]
- 297. LIMITING CONTROL SETTINGS (LCSs). The settings on safety systems that control process variables to prevent exceeding a safety limit. [10 CFR 830.3]
- 298. LINE ITEM PROJECT. Those separately identified project activities that are submitted for funding and are specifically reviewed and approved by Congress. [DOE O 430.1A]
- 299. LINE MANAGEMENT. Any management level within the line organization, including contractor management, that is responsible and accountable for directing and conducting work. [Derived from SMIT] [ISMS Guide]
- 300. LINE ORGANIZATION. That unbroken chain of command that extends from the Office of the Secretary to Secretarial Offices that set program policy and plans and develop assigned programs, to the field element organizations responsible for execution of these programs, to the contractors that conduct the work. [DOE Glossary] [ISMS Guide]

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301. LISTED/APPROVED. Equipment or materials that have been tested, passed, and are included in a current list published by a nationally recognized testing laboratory which is concerned with product evaluation and is acceptable to the Authority Having Jurisdiction. The laboratory maintains periodic inspection of production of listed equipment or materials. Such lists state either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner. This definition applies to products which are Underwriter's Laboratories or Factory Mutual approved. [DOE-STD-1066-97]
302. LOW-LEVEL RESIDUAL FIXED RADIOACTIVITY. The remaining radioactivity following reasonable efforts to remove radioactive systems, components, and stored materials. The remaining radioactivity is composed of surface contamination that is fixed following chemical cleaning or some similar process; a component of surface contamination that can be picked up by smears; or activated materials within structures. The radioactivity can be characterized as low-level if the smearable radioactivity is less than the values defined for removable contaminated by 10 CFR Part 835, Appendix D, Surface Contamination Values, and the hazard analysis results show that no credible accident scenario or work practices would release the remaining fixed radioactivity or activation components at levels that would prudently require the use of active safety systems, structures, or components to prevent or mitigate a release of radioactive materials. [10 CFR 830.3]
303. LOW-LEVEL WASTE (LLW). Radioactive waste not classified as high-level waste, TRU waste, spent nuclear fuel, or byproduct material, as defined by DOE O 5820.2A. [DOE O 6430.1A]
304. LOW-LEVEL WASTE. Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material. [Adapted from: Nuclear Waste Policy Act of 1982, as amended] [DOE M 435.1-1]
305. MAGAZINE. Any building or structure, except an operating building, used for the storage of ammunition or explosives. A storage area containing magazines shall be located at not less than an inhabited building separation from other areas, such as operational explosives buildings, administration/office buildings, shop, and installation boundaries. [DOE O 6430.1A]

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- 306. MAGAZINE DISTANCE. The minimum distance permitted between any two storage magazines. The distance required is determined by the type(s) of magazine and also the type and quantity of explosives stored therein. [DOE M 440.1-1]
- 307. MAINTENANCE. Day-to-day work that is required to maintain and preserve plant and capital equipment in a condition suitable for it to be used for its designated purpose and includes preventive, predictive, and corrective (repair) maintenance. [DOE O 4330.4B] [EH62dd1]
- 308. MAINTENANCE BACKLOG. The amount of maintenance and repair work not accomplished that is needed or planned to sustain the assigned mission. [DOE O 4330.4B]
- 309. MAINTENANCE BACKLOG. The amount of maintenance and repair work not accomplished at the end of the fiscal year that is needed or planned to sustain the assigned mission as evidenced by the number of overdue incomplete maintenance work orders for either planned or unplanned maintenance activities. [Charles Ramsey, EH-31, 02/99, based loosely on DOE O 4330.4B]
- 310. MAINTENANCE IMPORTANCE GENERATOR (MIG). A computerized system using predetermined rules to compare data on a maintenance job request and to establish relative-importance ranking for each maintenance job. [DOE-STD-1050-93]
- 311. MAINTENANCE JOB REQUEST (MJR). Means of obtaining maintenance services available on both paper and electronic mediums and initiated by maintenance customers. Issued to Maintenance Planners and Estimators and used to define, plan, and execute maintenance activities. Documentation of a deficient equipment condition, requires detailed documentation of work performed, spare parts, procedures, or testing to verify maintenance was performed correctly. The MJR may also serve as documentation for completion of minor maintenance activities such as lubrication, light bulb replacement, etc. [DOE-STD-1050-93]
- 312. MAINTENANCE MANAGEMENT. The administration of a program utilizing such concepts as organization, plans, procedures, schedules, cost control, periodic evaluation, and feedback for the effective performance and control of maintenance with adequate provisions for interface with other concerned disciplines such as health, safety, environmental compliance, quality control, and security. All work



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done in conjunction with existing property is either maintenance (preserving), repair (restoring), service (cleaning and making usable), or improvements. The work to be considered under the DOE maintenance management program is only that for maintenance and repair. [DOE O 4330.4A] [EH62dd1]

313. MAINTENANCE PLAN. A narrative description of a site's maintenance program. The plan should be a real-time document which is updated at least annually and which addresses all elements of a successful maintenance program. The plan should describe the backlog and strategies to reduce the backlog, as well as the maintenance funding required to sustain the assigned mission. The maintenance plan should integrate individual maintenance activities addressed under each functional unit life-cycle plan. [DOE O 4330.4A] [EH62dd1]
314. MAINTENANCE PROCEDURE. A document providing direction to implement DOE policy, comply with DOE and external directives, laws or meet operational objectives in a consistent manner. A procedure provides adequately detailed delineation of instructions, roles, responsibilities, action steps, and requirements for conducting maintenance activities. [DOE-STD-1050-93]
315. MAINTENANCE WORK INSTRUCTIONS. Written instructions provided to maintenance workers directing them on how to perform specific tasks. The level of detail of these instructions is based on the complexity of the task, special engineering considerations/specifications, and skill levels of the workers performing the task (skill-of-the-craft). [DOE-STD-1050-93]
316. MAINTENANCE WORK PACKAGE. A consolidated document used by maintenance organizations which contains all the necessary procedures, instructions and requirements to safely and effectively perform a maintenance task. A maintenance task should not be considered complete until all of the requirements of the Maintenance Work Package have been satisfied. [DOE-STD-1050-93]
317. MAJOR MODIFICATION. A modification to a DOE nuclear facility that is completed on or after April 9, 2001, that substantially changes the existing safety basis for the facility. [10 CFR 830.3]
318. MANAGEMENT AND OPERATING CONTRACT. An agreement for the operation, maintenance, or support, on behalf of the Government, of a Government-owned or controlled research, development, special production, or

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testing establishment wholly or principally devoted to one or more major programs of DOE. [10 CFR 707.4]

- 319. MANAGEMENT CONTROLS (INTERNAL CONTROLS). The organization, procedures, and methods managers use to achieve their goals, including processes for planning, organizing, directing, and controlling operations. Management controls are designed to provide reasonable assurance that (1) programs achieve intended results; (2) resource use is consistent with DOE's mission and resources are protected from waste, loss, unauthorized use, and misappropriation; (3) laws and regulations are followed; and (4) decisions are based on reliable data. Management controls apply to all programs and administrative functions. [DOE Glossary] [ISMS Guide]
- 320. MANUALS/CODES OF PRACTICE. As applied to integrated safety management, documented instructions that define methods, processes, and procedures for DOE and the contractor to use in implementing safety requirements and guidelines. These manuals/codes of practice document the safety infrastructure of an integrated safety management system and provide the basis for work planning, authorization protocols, formality of operations, and feedback and improvement processes. [DNFSB mandated] [ISMS Guide]
- 321. MARGIN. The difference between service conditions and the design parameters used in the design of a component, system, or structure. [DOE O 5480.EQ] [EH62dd1]
- 322. MARGIN OF SAFETY. That margin built into the safety analyses of the facility as set forth in the authorization basis acceptance limits. [DOE O 5480.21] [EH62dd1]
- 323. MATERIAL ACCESS AREA (MAA). An area that contains a Category I quantity of special nuclear materials and is specifically defined by physical barriers, located within a Protected Area, and subject to specific access controls. [DOE O 6430.1A]
- 324. MATERIAL BALANCE AREA (MBA). A subsidiary account of a facility designed to establish accountability and to localize inventory differences. [DOE O 6430.1A]
- 325. MAXIMUM CREDIBLE FIRE LOSS (MCFL). The property damage that would be expected from a fire, assuming that:

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- A. All installed fire protection systems function as designed.
  - B. The effect of emergency response is omitted except for post-fire actions such as salvage work, shutting down water systems, and restoring operation. [DOE O 5480.7A] [EH62dd1]
326. MAXIMUM POSSIBLE-FIRE LOSS (MPFL). The value of property, excluding land value, within a fire area, unless a fire hazards analysis demonstrates a lesser (or greater) loss potential. This assumes the failure of both automatic fire suppression systems and manual fire fighting efforts. [DOE-STD-1066-97]
327. MEDICAL REMOVAL PROTECTION BENEFITS. The employment rights established by section 850.35 of 10 CFR Part 850 for beryllium-associated workers who voluntarily accept temporary or permanent medical removal from beryllium areas following a recommendation by the Site Occupational Medicine Director. [10 CFR 850.3]
328. MEDICAL REVIEW OFFICER (MRO). A licensed physician, approved by DOE to perform certain functions under this part. The MRO is responsible for receiving laboratory results generated by an employer's drug testing program, has knowledge of illegal drug use and other substance abuse disorders, and has appropriate medical training to interpret and evaluate an individual's positive test result, together with that person's medical history and any other relevant biomedical information. For purposes of this part a physician from the site occupational medical department may be the MRO. [10 CFR 707.4]
329. MEMBER OF THE PUBLIC. An individual who is not a general employee. An individual is not a "member of the public" during any period in which the individual receives occupational exposure. [10 CFR 835.2]
330. MILD ENVIRONMENT. An environment expected as a result of normal service conditions and extremes (anticipated/transient operational occurrences) in service conditions where seismic is the only design basis event of consequence. [DOE O 5480.EIA] [EH62dd1]
331. MINOR. An individual less than 18 years of age. [10 CFR 835.2]
332. MINOR MAINTENANCE. Maintenance actions for deficiencies on facilities, equipment or parts where all the following conditions are met:

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- A. The component is not important to safety. If the component is important to safety, the portion or part being worked does not perform or affect a safety function.
  - B. The component or part does not perform an environmental qualification (EQ) function.
  - C. Integrity of the component will not be violated.
  - D. Material substitution will not be involved.
  - E. Disassembly of the component or part will not be required.
  - F. Welding will not be performed on a component or part of the component that is important to safety or seismically mounted.
  - G. Welding will not be performed on a pressure vessel.
  - H. Welding will not be performed on system piping.
  - I. A tagout/lockout will not be required.
  - J. The work performed is of such a minor nature that a written procedure is not required. However, if a procedure exists, it may be used.
  - K. "Documented" postmaintenance testing will not be required.
  - L. The work is of such a simple nature that a detailed Maintenance Work Package and job planning package is not required. [DOE-STD-1050-93]
333. MODEL BUILDING CODES. Codes that contain design and construction requirements that apply to normal commercial buildings (e.g., 1991 ICBO Uniform Building Code [UBC], the 1992 Supplement to the BOCA National Building Code, and the 1992 Amendments to the SBCCI Standard Building Code). [DOE O 5480.28] [EH62dd1] [DOE IG-420.1.4]
334. MODIFICATION. Any change made to structures, systems, components, or procedures during any phase of the life of the nuclear facility. [DOE O 5480.30] [EH62dd1]

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- 335. MONITORING. The measurement of radiation levels, airborne radioactivity concentrations, radioactive contamination levels, quantities of radioactive material, or individual doses and the use of results of these measurements to evaluate radiological hazards or potential and actual doses resulting from exposures to ionizing radiation. [10 CFR 835.2]
  
- 336. NATIONALLY RECOGNIZED TESTING LABORATORY. An organization that is recognized by the U.S. Occupational Safety and Health Administration in accordance with Appendix A of 29 CFR 1910.7 and that tests for safety, and lists or labels or accepts equipment or materials. (Examples include Factory Mutual and Underwriter's Laboratories.) [DOE O 6430.1A]
  
- 337. NATURAL PHENOMENA HAZARD (NPH). An act of nature (for example: earthquake, wind, hurricane, tornado, flood, precipitation [rain or snow], volcanic eruption, lightning strike, or extreme cold or heat) which poses a threat or danger to workers, the public, or to the environment by potential damage to structures, systems, and components. [DOE O 5480.28] [EH62dd1] [DOE IG-420.1.4]
  
- 338. NEW DOE NUCLEAR FACILITY. A DOE nuclear facility that begins operation on or after April 9, 2001. [10 CFR 830.3]
  
- 339. NEW FACILITY. A DOE nuclear facility that does not qualify as an existing facility. [DOE O 5480.30] [EH62dd1] [DOE IG-420.1.4]
  
- 340. NEW STORAGE FACILITY. A newly constructed facility or the conversion of existing facility, or portion of an existing facility, for use as an unirradiated enriched uranium storage facility. [DOE O 6430.1A]
  
- 341. NONCOMBUSTIBLE. A material that in the form in which it is used and under the conditions anticipated will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat, as defined by fire protection industry standards on the basis of large scale fire tests performed by a nationally recognized independent fire test authority. [DOE-STD-1066-97]
  
- 342. NON-GOVERNMENT STANDARD (NGS). Technical standards that are developed and maintained by national and international private sector bodies and are available for use by any person or organization, private, or governmental. NGSs are also referred to as "voluntary standards," "industry standards," or "consensus standards" (standards developed under procedures involving openness,

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balance of interest, and due process). They do not include professional standards of personal conduct, private standards of individual firms, standards mandated by law, or standards of individual organizations for their internal use. [DOE O 1300.2A]

343. NON-GOVERNMENT STANDARDS BODY (NGSB). A national or international scientific, technical, or professional, industry, or other organization, society, or association which is not organized for profit that conducts standardization activities and develops, establishes, coordinates, and maintains non-government standards. [DOE O 1300.2A]
344. NON-GOVERNMENT STANDARDS BODY SUPPORT. The types of support included are:
- Direct financial support (e.g., sustaining membership, grants, and contracts);
  - Technical support (e.g., cooperative testing for standards evaluation and participation of DOE representatives in the activities of standards-developing groups);
  - Administrative support (e.g., travel costs associated with meetings, hosting of meetings, and secretarial functions);
  - Planning support (e.g., joint planning with non-government standards bodies to facilitate a coordinated effort); and
  - Other funding support (e.g., travel funds and per diem costs for qualified consumer participation when such participation will improve the development of a standard). [DOE O 1300.2A] [EH62dd1]
345. NONREACTOR NUCLEAR FACILITY. Those facilities, activities or operations that involve, or will involve, radioactive and/or fissionable materials in such form and quantity that a nuclear or a nuclear explosive hazard potentially exists to workers, the public, or the environment, but does not include accelerators and their operations and does not include activities involving only incidental use and generation of radioactive materials or radiation such as check and calibration sources, use of radioactive sources in research and experimental and analytical laboratory activities, electron microscopes, and X-ray machines. [10 CFR 830.3]

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346. NONREACTOR NUCLEAR FACILITY. An operational area (e.g., building, holding, storage, or disposal area) dedicated to activities or operations (handling, storing, or transporting) that involve radioactive or fissionable materials, or both, in such form and quantity that a nuclear hazard potentially exists to the employees or the general public. Included are activities or operations that:
- A. Produce, process, or store radioactive liquid or solid waste, fissionable materials, or tritium;
  - B. Conduct separations operations;
  - C. Conduct irradiated and/or fissionable materials inspection, fuel fabrication, decontamination, or recovery operations;
  - D. Conduct fuel enrichment operations; or
  - E. Perform environmental remediation or waste management activities involving radioactive materials.

Incidental use and generation of radioactive materials in a facility operation (e.g., check and calibration sources, use of radioactive sources in research and experimental and analytical laboratory activities, electron microscopes, and X-ray machines) would not ordinarily require the facility to be included in this definition. Accelerators and reactors and their operations are not included. [DOE O 420.1A] [DOE G 421.1-1 (draft)]

347. NONSTOCHASTIC EFFECTS. Effects due to radiation exposure for which the severity varies with the dose and for which a threshold normally exists (e.g., radiation-induced opacities within the lens of the eye). [10 CFR 835.2]
348. NOTICE. DOE Notices, part of the DOE directives System, are one-time issuances used for short-term (1 year or less) instructions and information on any subject. Notices also may be used to immediately establish requirements for DOE Elements, and when incorporated into contracts, they also become requirements for DOE contractors. Notices may also disseminate needed information until an Order can be issued or amended. [DOE N 1321.138] [EH62dd1]
349. NOTIFICATION REPORT. The initial documented report, to the Department, of an event or condition that meets the reporting criteria defined in DOE O 5000.3B.

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The Notification Report shall consist of fields 1 through 18 of the Occurrence Report. [DOE O 5000.3B] [EH62dd1]

- 350. NPH MITIGATION. An action taken to reduce the impacts of Natural Phenomena Hazards (NPH). This includes natural phenomena hazard resistant design, evaluation, construction requirements, and operational procedures. [DOE O 5480.28] [EH62dd1] [DOE IG-420.1.4]
- 351. NUCLEAR CRITICALITY SAFETY. Protection against the consequences of an inadvertent nuclear fission chain reaction, preferably by preventing the reaction. [DOE G-421.1-1 (draft)]
- 352. NUCLEAR EXPERIENCE. Used in reference to:
  - A. CATEGORY A AND B REACTORS. Experience acquired at commercial, production, training, test, military, or research reactors and includes experience acquired in reactor facility startup activities or operation. Experience in design, construction, maintenance, or related technical services that is job-related may also be considered.. Appropriate research, or teaching, or both may be includable as nuclear experience.
  - B. NON-REACTOR NUCLEAR FACILITIES. Experience acquired at any facility in which radioactive materials are routinely handled, stored, processed, or utilized. [DOE O 5480.20A] [EH62dd1]
- 353. NUCLEAR EXPLOSIVE FACILITY. A facility where nuclear explosive operations or activities are performed. [DOE O 452.2A]
- 354. NUCLEAR EXPLOSIVE SAFETY STANDARDS. Five qualitative requirements for positive measures to prevent an accidental, inadvertent, or deliberate unauthorized nuclear detonation or actions that might lead to a detonation; to provide for physical security, and to prevent plutonium dispersal. These requirements may be met through design features, safety rules, and procedures that reduce risk.
- 355. NUCLEAR EXPLOSIVES OPERATIONS. Any activity involving a nuclear explosive, including activities in which main charge high-explosive parts and pit are collocated. [DOE O 452.2A]



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- 356. NUCLEAR FACILITY. A reactor or a nonreactor nuclear facility where an activity is conducted for or on behalf of DOE and includes any related area, structure, facility, or activity to the extent necessary to ensure proper implementation of the requirements established in 10 CFR 830. [10 CFR 830.3]
- 357. NUCLEAR FACILITY OPERATOR. A person certified by contractor nuclear facility management to manipulate or handle fissionable materials, radioactive materials, or tritium in such form and quantity that a nuclear hazard potentially exists to the employees or the general public, or to manipulate the controls of equipment used to produce, process, transfer, store, or package such materials at DOE nonreactor nuclear facilities. Nuclear facility operators typically include, but are not limited to, fissionable material handlers, tritium operators, chemical process operators, waste tank operators, and enrichment plant operators. [DOE G 830.330, Rev. 2]
- 358. NUCLEAR FACILITY SUPERVISOR. A person certified by contractor nuclear facility management to manipulate, handle, or direct the manipulation or handling of fissionable materials, radioactive materials, or tritium in such form and quantity that a nuclear hazard potentially exists to the employees or the general public, or to manipulate or direct the manipulation of the controls of equipment used to produce, process, transfer, store, or package such materials at DOE nonreactor nuclear facilities. Nuclear facility supervisors typically include, but are not limited to, fissionable material handler supervisors, tritium operator supervisors, chemical process operator supervisors, waste tank operator supervisors, and enrichment plant operator supervisors. [DOE F 830.330, Rev. 2]
- 359. NUCLEAR OPERATION. Processing, storing, transferring, or handling of significant quantities of fissionable material. [DOE O 420.1A]
- 360. NUCLEAR SAFETY. Aspects of safety that encompass activities and systems that present the potential for (1) uncontrolled releases of fission products or other radioactive materials to the environment or (2) for inadvertent criticality. [DOE Glossary] [ISMS Guide]
- 361. NUCLEAR SAFETY AUTHORIZATION BASIS. See AUTHORIZATION BASIS (Add “nuclear” in front of the word “facility” in first sentence). [DOE O 5480.21 and DOE O 5480.23]

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362. NUCLEAR SAFETY REQUIREMENTS. Mandatory nuclear safety criteria such as those issued in DOE rules, Orders, and notices. Non-mandatory guidance or "good practices" would not be considered to be a requirement. However, nuclear safety standards, safety guides, or other guidance which are considered mandatory or minimal acceptance practice when issued or are used as mandatory requirements for assessments would be considered to be the same as requirements. [EH62dd1]
363. NUCLEAR STATUTE. Any statute or provision of a statute that relates to a DOE nuclear activity and for which DOE is responsible. [10 CFR 820.2]
364. OCCUPANCY. The purpose for which a building, or portion thereof, is used or intended to be used. For DOE facilities, the occupancy classification for purposes of determining construction, protection and area limitations should be as determined under the provisions of the applicable local building code or the Uniform Building Code unless otherwise specified by the DOE Authority Having Jurisdiction. [DOE-STD-1066-97]
365. OCCUPATIONAL CARCINOGEN. A chemical substance that has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen (i.e., Groups 1, 2A, or 2B); is listed as a substance known or reasonably anticipated to be carcinogenic in the Annual Report on Carcinogens published by the National Toxicology Program (NTP); is categorized as a confirmed human carcinogen or suspected human carcinogen (i.e., designated as A1 or A2 substances) by the American Conference of Governmental Industrial Hygienists (ACGIH); or is regulated by the U.S. Occupational Safety and Health Administration as a carcinogen in an expanded health standard. [DOE O 5480.10A (Draft)]
366. OCCUPATIONAL CARCINOGEN. For purposes of DOE G 440.1-3, a chemical substance utilized in the workplace that has been designated in the following sources as a carcinogen or potential carcinogen: (a) National Toxicology Program, *Annual Report on Carcinogens* (latest edition); (2) International Agency for Research on Cancer, *Monographs* (latest editions); U.S. Occupational Safety and Health Administration standard 29 CFR 1910, Subpart Z, *Toxic and Hazardous Substances*; and (4) American Conference of Governmental Industrial Hygienists, *Threshold Limit Values for Chemical Substances and Physical Agents*. [DOE G 440.1-3]

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367. OCCUPATIONAL DOSE. An individual's ionizing radiation dose (external and internal) as a result of that individual's work assignment. Occupational dose does not include doses received as a medical patient or doses resulting from background radiation or participation as a subject in medical research programs. [10 CFR 835.2]
368. OCCUPATIONAL HEALTH PROGRAM. A comprehensive and coordinated effort of those involved in Radiological Protection, Industrial Hygiene, Occupational Medicine, and Epidemiology to protect the health and well-being of Department of Energy contractor employees in government-owned or -leased facilities. [DOE O 5480.10A (Draft)]
369. OCCUPIED AREA (EXPLOSIVES). Any work area to which personnel are assigned or any non-work area where persons regularly congregate. In the context of Class II bays for explosive facilities, access ramps, and plant roads are not considered occupied areas. [DOE O 6430.1A]
370. OCCURRENCE. An event or a condition that adversely affects, or may adversely affect, DOE or contractor personnel, the public, property, the environment, or the DOE mission. Events or conditions meeting the criteria threshold identified in DOE M 232.1-1A are occurrences. [DOE M 232.1-1A]
371. OCCURRENCE. Any event or incident that is a deviation from the planned or expected behavior or course of events in connection with any Department of Energy or Department of Energy-controlled operation, if the deviation has environmental, public health and safety, or national security protection significance. Incidents having such significance include the following, or incidents of a similar nature:
- A. Injury or fatality to any person involving actions of a Department of Energy contractor employee.
  - B. Involvement of nuclear explosives under Department of Energy jurisdiction which results in an explosion, fire, the spread of radioactive material, personal injury or death, or significant damage to property.
  - C. Accidental release of pollutants which results or could result in a significant effect on the public or environment.

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D. Accidental release of radioactive material above regulatory limits.

[10 CFR 707.4][Applicable only to this specific rule]

- 372. OCCURRENCE REPORT. A documented evaluation of an event or condition that is prepared in sufficient detail to enable the reader to assess its significance, consequences, or implications and to evaluate the actions being proposed or employed to correct the condition or to avoid recurrence. [DOE Glossary] [ISMS Guide]
- 373. OCCURRENCE REPORTING AND PROCESSING SYSTEM (ORPS). The reporting system established and maintained for reporting occurrences related to the operation of DOE facilities. [DOE G 225.1A-1]
- 374. OFFICE OF PRIMARY INTEREST. The office most involved in the activity under consideration. Most DOE initiatives will affect many offices; that office being most affected and assuming a dominant role in the initiative is the Office of Primary Interest.
- 375. OFFICIAL OF DOE. Any officer or employee of DOE whose duties include program management or the investigation or enforcement of any law, rule, or regulation relating to Government contractors or the subject matter of a contract. [10 CFR 708.4]
- 376. OIL. Oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. [DOE O 5000.3B] [EH62dd1]
- 377. OPERABLE. The state of being operated or having the potential for being operated to fulfill the mission it was designed for. A facility that cannot be operated on a day-to-day basis because of refueling, extensive modifications, or technical problems is still considered to be operable. A facility that has been officially placed in a standby or shutdown condition, or in an environmental remediation status, but in which personnel manipulate or handle fissionable materials, radioactive materials, or tritium in such form and quantity that a nuclear hazard potentially exists to the employees or the general public, or manipulate the controls of equipment used to produce, process, transfer, or store such materials, is also considered operable. [DOE O 5480.20A]

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- 378. OPERATING EXPERIENCE. Verifiable service data for equipment. [DOE O 5480.EQ] [EH62dd1]
- 379. OPERATING LIMITS. Those limits required to ensure the safe operation of a nuclear facility, including limiting control settings and limiting conditions for operation. [10 CFR 830.3]
- 380. OPERATING ORGANIZATION. The assigned site personnel responsible for operation, maintenance, and technical support services related to operations. This organization may include offsite personnel who provide operational support. [DOE O 5480.20A][EH62dd1]
- 381. OPERATIONAL DESIGN BASIS ACCIDENT (DBA). Any DBA caused by an internal event. Direct causes are usually poor design or procedures, operator errors, equipment failures, or inadequate technical development (unknowns) that lead to the accident. The major accident categories are explosion, fire, nuclear criticality, leaks to the atmosphere, and leaks to the aquatic environment. [DOE O 6430.1A]
- 382. OPERATIONAL EVALUATION. A documented evaluation of an individual's knowledge and skills. The operational evaluation is a facility walk through that may include system and/or component operation, or simulation of operations, during which the candidate is observed and questioned regarding procedures, safety implications, and Technical Safety Requirements. [DOE O 5480.20A]
- 383. OPERATIONAL READINESS REVIEW/ASSESSMENT. A disciplined, systematic, documented, performance-based examination of facilities, equipment, personnel, procedures, and management control systems to ensure that a facility will be operated safely within its approved safety envelope as defined by the facility safety basis. [Deleted from DOE Glossary] [ISMS Guide]
- 384. OPERATIONAL SAFETY CONTROLS. Safety limits, operating limits, surveillance requirements, safety boundaries, and management and administrative controls that significantly contribute to protecting workers, the public, and the environment from hazards other than nuclear detonation, high-explosive detonation and deflagration, and fire (which are addressed by Nuclear Explosive Safety Rules) for specific nuclear explosive operations and associated activities. [DOE O 452.2A] [ISMS Guide]
- 385. OPERATIONAL SAFETY REQUIREMENT. See Technical Safety Requirement definition. [DOE O 5480.20A] [EH62dd1]

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- 386. OPERATIONAL READINESS REVIEW. A disciplined, systematic, documented, performance based examination of facilities, equipment, personnel, procedures, and management control systems to ensure that a facility will be operated safely within its approved safety envelope as defined by the facility safety basis. The Operational Readiness Review scope is defined based on the specifics of the facility and/or the reason for the shutdown as related to a minimum set of core requirements. A graded approach will be used in defining the depth of the Operational Readiness Review based on these core requirements. [DOE O 5480.31] [EH62dd1]
- 387. OPERATIONAL READINESS REVIEW BREADTH. The set of core requirements which will be evaluated by the Operational Readiness Review team during conduct of the Operational Readiness Review. [DOE O 5480.31] [EH62dd1]
- 388. OPERATIONAL READINESS REVIEW DEPTH. The level of analysis, documentation, and/or actions necessary to evaluate an applicable core requirement. [DOE O 5480.31] [EH62dd1]
- 389. OPERATIONAL READINESS REVIEW IMPLEMENTATION PLAN. The plan developed by the Operational Readiness Review team describing the specifics of the approach, methodology and reporting requirements of the Operational Readiness Review. [DOE O 5480.31] [EH62dd1]
- 390. OPERATIONAL READINESS REVIEW SCOPE. The overall magnitude of the Operational Readiness Review as defined by the breadth of core requirements selected and the depth of evaluation of these core requirements during conduct of the Operational Readiness Review. [DOE O 5480.31] [EH62dd1]
- 391. ORDERS. DOE Orders, part of the DOE directives system, are the prevailing means by which DOE identifies management objectives which are requirements for DOE personnel and, when incorporated into contracts, requirements for DOE contractors. Most DOE nuclear safety Orders are in the process of being superseded by regulations. Orders on nuclear safety will continue to be upgraded and issued on an interim basis since the rulemaking process can be lengthy. [EH62dd1]
- 392. ORIGINATOR. The DOE, contractor, or subcontractor employee who originates the employee concerns. [DOE O 5480.29] [EH62dd1]

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393. OUTAGE. A condition that exist whenever normal production operations have ceased and all structures, systems, and components and processes are shutdown, properly aligned or otherwise in an appropriate status, due to planned or unplanned occurrences. [DOE-STD-1050-93]
394. OVERPRESSURE. The maximal effective pressure is the larger (if applicable) of a, b or c:
- A. The peak incident pressure;
  - B. The incident plus dynamic pressure; or
  - C. The reflected pressure (ref. TM 5-1300). [DOE O 5480.30]
395. OVERSIGHT. The responsibility and authority assigned to the Assistant Secretary for Environment, Safety and Health to independently assess the adequacy of DOE and contractor performance. Oversight is separate and distinct from line management activities, including self assessments. [DOE Glossary]
396. PARTICIPATION. Taking an active role in the duties and responsibilities relative to the function for which the candidate/trainee is being considered. Simple observation is not considered participation. [DOE O 5480.20A]
397. PARTICIPATION. The activity associated with DOE representation through oral or written communication that influences the development of non-government standards or the administration of non-government standards bodies (NGSBs). Participation also includes providing support to NGSBs to the extent defined in this Order. [DOE O 1300.2A] [EH62dd1]
398. PARTY. The Director and the respondent in an enforcement adjudication under this part. [10 CFR 820.2]
399. PARTY OR PARTIES. Any employee, contractor, or other party named in a proceeding under this part. [10 CFR 708.4]
400. PEAK POSITIVE INCIDENT PRESSURE. The almost instantaneous rise from the ambient pressure caused by a blast wave's pressure disturbance. [DOE O 6430.1A]

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- 401. PERFORMANCE CATEGORY (PC). A classification using a graded approach in which structures, systems, or components in a category are designed to assure similar levels of protection (i.e., meet the same performance goal) during natural phenomena hazard events. [DOE O 5480.28] [EH62dd1] [DOE IG-420.1.4]
- 402. PERFORMANCE DEGRADATION. Failure or degradation of a facility, process, system or component that reduces the reliability of critical components of the facility whose loss or degradation prevents the system from performing its intended function. Performance degradation does not include: (1) A burned out power indicator light on a piece of radiation monitoring equipment which does not prevent the equipment from detecting elevated radiation levels and alarming as designed; (2) A piece of equipment that is determined to be out of calibration on the conservative side (such as a low level alarm that alarms at a higher value than it should); or (3) the temporary loss of a component where identical redundant components are maintained in operation and the minimum authorization bases is not compromised. [DOE M 232.1-1]
- 403. PERFORMANCE INDICATOR. Operational information indicative of the performance or condition of a facility, group of facilities, or site. [DOE Glossary] [ISMS Guide]
- 404. PERFORMANCE GOAL. The mean annual probability of exceedance of acceptable behavior limits used as a target to develop natural phenomena hazard mitigation requirements. [DOE O 5480.28] [EH62dd1]
- 405. PERFORMANCE MONITORING. Systematic monitoring and trending of the performance of selected facility structures, systems, and components to measure and assess the impact of any performance changes on overall facility efficiency, reliability, and availability. [DOE-STD-1050-93]
- 406. PERFORMANCE TEST. A test of structures, systems, and components to verify that acceptable designed-in performance characteristics are being achieved; or, to detect any abnormal performance characteristics for which corrective actions may be needed. The documented test results should also be used to determine the effect of maintenance and operating activities on equipment performance so that either availability or reliability factors can be obtained. [DOE-STD-1050-93]
- 407. PERFORMANCE-BASED MAINTENANCE. Tailoring the preservation or maintenance of structures, systems, and components important to safety in terms of



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results as approved in a DOE Safety Management System that is implemented under 48 CFR 970.5204.2. The use of measurable (i.e., terms of quality, timeliness and quantity) performance standards and objectives where appropriate (i.e., use of a "graded approach"). [Charles Ramsey, EH-31, 1998]

- 408. PERFORMANCE-BASED REGULATIONS. Regulations that are outcome-oriented rather than procedure-oriented. [ISMS Guide]
- 409. PERIODIC MAINTENANCE. Preventive, predictive, or seasonal maintenance activities performed on a routine basis (typically based on operating hours or calendar time) and may include any combination of external inspections, alignments or calibrations, internal inspections, overhauls, and structure, systems, and component replacements. [DOE-STD-1050-93]
- 410. PERMISSIBLE EXPOSURE LIMIT. The maximum level of exposure to airborne contaminants or physical agents to which an employee may be exposed over a specified time period, as mandated by the U.S. Occupational Safety and Health Administration in 29 CFR Part 1910 or 29 CFR Part 1926. [DOE O 5480.10A (Draft)]
- 411. PERMISSIBLE EXPOSURE LIMIT (PEL). The maximum level to which an employee may be exposed to a hazardous agent in a specified period, as defined by the U.S. Occupational Safety and Health Administration in 29 CFR 1910 or 29 CFR 1926. (The airborne PEL is based on concentrations in the ambient air and does not consider personal protective equipment.) [DOE G 440.1-3]
- 412. PERSON. Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency, any State or political subdivision of, or any political entity within a State, any foreign government or nation or any political subdivision of any such government or nation, or other entity and any legal successor, representative, agent or agency of the foregoing; provided that person does not include the Department or the United States Nuclear Regulatory Commission. For purposes of civil penalty assessment, the term also includes affiliated entities, such as a parent corporation. [10 CFR 820.2]
- 413. PERSON. Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency, any State or political subdivision of, or any political entity within a State, any foreign government or nation or other entity, and any legal successor, representative, agent or agency of

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the foregoing, provided that person does not include the Department or the United States Nuclear Regulatory Commission. [10 CFR 835.2]

- 414. PERSONAL MONITORING. The process of measuring the concentration of a hazardous chemical in the breathing zone of an exposed individual using a method such as a personal air pump or direct reading instrument. Area monitoring is not considered personal monitoring. [DOE O 5480.10A (Draft)]
- 415. PERSONAL MONITORING. The process of measuring the concentration of a hazardous chemical in the breathing zone of an individual, using a method such as a personal air pump to gather a sample for analysis, a direct-reading instrument, or a monitor worn by the worker in the breathing zone. For physical or biological agents, it is the process of measuring the quantity that potentially contacts or affects any part of an exposed individual. Area monitoring is not considered personal monitoring. [DOE G 440.1-3]
- 416. PERSONNEL MONITORING (radiation). Systematic and periodic estimate of radiation dose received by personnel during working hours. Also, the monitoring of personnel, their excretions, skin, or any part of their clothing to determine the amount of radioactivity present. [DOE G 440.1-3]
- 417. PHYSICAL ASSETS. ALL DOE-owned or DOE-used and -controlled land, land improvements, structures, utilities, motor vehicles, equipment, and components are included.
  - A. REAL PROPERTY OR REAL ESTATE. Real property includes land, improvements on the land, or both, including interests therein. All equipment or fixtures (such as plumbing, electrical, heating, built-in cabinets, and elevators) that are installed in a building in a more or less permanent manner or that are essential to its primary purpose are usually held to be part of real property.
  - B. RELATED PERSONAL PROPERTY. Related personal property means any personal property that, once installed, becomes an integral part of the real property in which it is installed or is related to, designed for, or specially adapted to the functional or productive capacity of the real property. The removal of related personal property will significantly diminish the economic value of the real property or the related personal property. Examples of related personal property are communications and telephone systems.

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- C. PERSONAL PROPERTY. Generally, capitalizable property that can be moved, or that is not permanently affixed to and part of real estate. Generally, items remain personal property if they can be removed without seriously damaging or diminishing the functional value of either the capitalizable property or the real estate. Examples of personal property are shop equipment and automated data-processing and peripheral equipment. [DOE O 430.1A]
418. PLAN-OF-ACTION. The initiating document for a readiness review which identifies those actions required for startup or restart of a nuclear facility which as a minimum include: the readiness review team participants with their respective responsibilities and qualifications; the scope of the readiness review in terms of the topical areas to be covered (e.g., systems included, procedures, and training); a schedule of events; and status of compliance with DOE Orders. [EH62dd1]
419. PLANNED MAINTENANCE. Preventive, or seasonal maintenance activities performed prior to structure, system, and component failure which may be initiated by predictive or periodic maintenance results; through vendor recommendations, or by experience/lessons learned. These include actions such as scheduled cold weather protection, valve repacking, replacement of bearings as indicated from vibration analysis, major or minor overhauls based on experience factors, or vendor recommendations and replacement of known life-span components. For example, repacking a valve due to packing leakage would be corrective maintenance, but scheduled repacking prior to leakage would be planned maintenance. [DOE-STD-1050-93]
420. PLANNED SHUTDOWN. A facility shutdown required to perform scheduled activities (such as programmatic or equipment adjustments, reactor refueling, maintenance, surveillance, tests, inspections, and/or safety upgrades) or for programmatic reasons unrelated to the facility's ability to operate, such as a funding shortfall, is a planned shutdown.
421. PLUTONIUM PROCESSING AND HANDLING FACILITY. Any facility constructed primarily to process plutonium (Pu) (including Pu 238) and that handles substantial quantities of in-process Pu where there is a possibility of a release of Pu to the environs under normal operations or Design Basis Accident conditions in excess of limits set forth in the directive on Radiation Protection of the Public and the Environment in the DOE 5400 Order series. [DOE O 6430.1A]

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- 422. PLUTONIUM STORAGE FACILITY (PSF). Any facility constructed to store strategic (category I) quantities of plutonium (Pu). [DOE O 6430.1A]
- 423. POLICY STATEMENTS. A policy statement is a top level DOE directive which is the Department's statement of nuclear safety philosophy and values. All other requirements and guidance flow from and must be consistent with the policy. It applies equally to the work of DOE Elements and the work of contractors and subcontractors conducting activities in DOE Nuclear Facilities. The DOE nuclear safety policy, currently stated in SEN-35-91, will be incorporated into the DOE directives system. The directive on nuclear safety policy will include a set of supporting topical policy statements which, when implemented, will support the nuclear safety policy. The directive on nuclear safety policy will necessarily be general and will be implemented through more specific basic nuclear, safety requirements established in DOE Regulations and Orders. [DOE N 1321-138] [EH62dd1]
- 424. POST-ACCIDENT MONITORING (PAM) EQUIPMENT. Equipment and instrumentation necessary to monitor the parameters necessary to assess facility and environs conditions both on-site and off-site, during and following an accident. PAM equipment and instrumentation must have an extended operating range or measuring range to envelop the conditions of the accidents. [EH62dd1]
- 425. POSTMAINTENANCE TEST. Applicable and appropriate testing performed following maintenance to verify that a particular structure, system, and component, piece of equipment, or process performs its intended function based on its design criteria and that the original deficiency has been corrected and no new deficiencies created. In some cases, the extent of a particular postmaintenance test may extend beyond the component or piece of equipment that has been repaired, replaced or modified to complete systems or processes, depending on the type of maintenance action performed and the affect that the component or piece of equipment has on the total system or process. [DOE-STD-1050-93]
- 426. POWER PLANT EXPERIENCE. Experience acquired in the testing, operation, or maintenance of power generating facilities. Experience in design and construction may be considered applicable power plant experience and should be evaluated on a case-by-case basis. [DOE O 5480.20A]
- 427. PREDICTIVE MAINTENANCE. Predictive maintenance consists of the actions necessary to monitor, find trends, and analyze parameters, properties and performance characteristics or signatures associated with structures, systems, and

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components (SSCs), facilities or pieces of equipment to discern whether or not a state or condition may be approaching which is indicative of deteriorating performance or impending failure, where the intended function of the SSCs, facilities or pieces of equipment may be compromised. Predictive maintenance activities involve continuous or periodic monitoring and diagnosis in order to forecast component degradation so that "as-needed" planned maintenance can be initiated prior to failure. Not all SSC, facility or equipment conditions and failure modes can be monitored and diagnosed in advance; therefore, predictive maintenance should be selectively applied. To the extent that predictive maintenance can be relied on without large uncertainties, it is normally preferable to activities such as periodic internal inspection or equipment overhauls. [DOE-STD-1052-93]

428. PRELIMINARY DOCUMENTED SAFETY ANALYSIS. Documentation prepared in connection with the design and construction of a new DOE nuclear facility or a major modification to a DOE nuclear facility that provides a reasonable basis for the preliminary conclusion that the nuclear facility can be operated safely through the consideration of factors such as
- A. The nuclear safety design criteria to be satisfied;
  - B. A safety analysis that derives aspects of design that are necessary to satisfy the nuclear safety design criteria; and
  - C. An initial listing of the safety management programs that must be developed to address operational safety considerations.

[10 CFR 830.3]

429. PRELIMINARY NOTICE OF VIOLATION. A document issued by the Director in which the Director sets forth the preliminary conclusions that the respondent has violated or is continuing to violate a DOE Nuclear Safety Requirement and includes:
- (i) A statement specifying the DOE Nuclear Safety Requirement to which the violation relates;
  - (ii) A concise statement of the basis for alleging the violation;
  - (iii) Any proposed remedy, including the amount of any proposed civil penalty; and

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- (iv) A statement explaining the reasoning behind any proposed remedy.

[10 CFR 820.2]

- 430. PRELIMINARY SAFETY ANALYSIS REPORT (PSAR). The safety analysis report submitted to and approved by DOE prior to the procurement of materials or components, construction, and preoperational testing of a facility which has the potential in its intended use to be a Category 1, 2, or 3 hazard nuclear facility.
- 431. PRESIDING OFFICER. The Administrative Law Judge designated to be in charge of an enforcement adjudication who shall conduct a fair and impartial hearing, assure that the facts are fully elicited, adjudicate all issues, avoid delay, and shall have authority to:
  - (i) Conduct an adjudicatory hearing under this part;
  - (ii) Rule upon motions, requests, and offers of proof, dispose of procedural requests, and issue all necessary orders;
  - (iii) Exercise the authority set forth in § 820.8;
  - (iv) Admit or exclude evidence;
  - (v) Hear and decide questions of fact, law, or discretion, except for the validity of regulations and interpretations issued by DOE;
  - (vi) Require parties to attend conferences for the settlement or simplification of the issues, or the expedition of the proceedings;
  - (vii) Draw adverse inferences against a party that fails to comply with his orders;
  - (viii) Do all other acts and take all measures necessary for the maintenance of order and for the efficient, fair and impartial adjudication of issues arising in proceedings governed by these rules.

[10 CFR 820.2]

- 432. PRESTART FINDING. A finding that must be corrected before an activity can be started. [DOE O 5480.31] [EH62dd1]

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- 433. PRE-TRANSFER REVIEW. Serves to provide the safety basis and physical and administrative characteristics of the facility subsequent to the cessation of operations, and prior to transferring the facility for the disposition phase. The objective of the review is to identify and evaluate, using a graded approach, the explicit boundaries of the facility(ies) being transferred; their physical condition; extent, nature and level of contamination (as appropriate on a case-by-case basis); inventories/estimates of types and quantities of special nuclear, fissionable, and toxic, hazardous, and radioactive materials; summary and evaluation of the safety basis and surveillance and maintenance requirements; and other elements to ensure that sufficient information is provided to facilitate an understanding of the facility and its surveillance and maintenance requirements. Documentation is generally expected to be provided from the analysis of available information, without extensive, new, characterization work. [DOE O 430.1A]
  
- 434. PREVENTIVE MAINTENANCE. All those systematically planned and scheduled actions performed for the purpose of preventing equipment, system, or facility failure. [DOE O 4330.4A] [EH62dd1]
  
- 435. PRIMARY ENVIRONMENTAL MONITORS. Monitoring equipment legally required to monitor ongoing discharges. In general, this term applies to monitors closest to the point of discharge which are used to determine if discharges are within specified limits. It also includes any equipment which actuates automatically in response to set level signals from such a monitor. It does not include equipment in general area, remediation, or compliance monitoring programs. [DOE O 5000.3B] [EH62dd1]
  
- 436. PROBABILISTIC METHOD. A technique which uses distributions of parameters (including uncertainty and randomness) to perform an analysis. Results are expressed in terms of probabilistic distributions, which quantify uncertainty. [DOE O 5480.28] [EH62dd1] [DOE IG-420.1.4]
  
- 437. PROCEDURE. A document that prescribes a process (a sequence of actions) to be performed to achieve a desired outcome. [EH62dd1] [ISMS Guide]
  
- 438. PROCESS. A series of actions that achieves an end or result. [10 CFR 830.3]
  
- 439. PROGRAM MANAGER. a. (Chief Financial Officer) An individual in an organization or activity responsible for the management of a specific function or functions and responsible for budget formulation and execution of the approved

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budget. The individual is the recipient of an approved funding program from the Office of Chief Financial Officer identifying his or her program dollars available to accomplish the assigned function. b. (Environment, Safety and Health) The Headquarters individual, or his/her designee, designated by and under the direction of a Secretarial Officer, who is directly involved in the operation of facilities under his/her cognizance, and holds signature authority to provide technical direction through heads of field elements/operations office organizations to contractors for these facilities. [DOE Glossary] [ISMS Guide]

440. (DOE ACCIDENT INVESTIGATION) PROGRAM MANAGER. The individual within the Office of the Deputy Assistant Secretary for Oversight responsible for administering the DOE accident investigation program on behalf of the Assistant Secretary for Environment, Safety and Health [DOE G 225.1A-1]
441. PROGRAM OFFICE. A Headquarters organization responsible for executing program management functions, and for assisting and supporting field elements in safety and health, administrative, management, and technical areas. [DOE Glossary] As used in DOE M 411.1-1, a program office is a DOE first-tier organization having responsibility for one or more of the Department's congressionally established missions. These offices report to the Assistant Secretaries for Defense Programs; Energy Efficiency and Renewable Energy; Environmental Management; and Fossil Energy, and the Offices of Civilian Radioactive Waste Management; Energy Research; Fissile Materials Disposition; Nonproliferation and National Security; and Nuclear Energy, Science and Technology.

Some secretarial offices commonly refer to their component organizations having responsibilities for specific program elements as being “program offices.”

442. PROGRAM SECRETARIAL OFFICER (PSO). The heads of DOE offices with responsibility for specific DOE nuclear facilities. These include the Assistant Secretaries for Defense Programs, Environmental Restoration and Waste Management and the Directors of Energy Research, Civilian Radioactive Waste Management, and Nuclear Energy. [DOE O 5000.3B] [EH62dd1]
443. PROGRAM SIGNIFICANT COST. Meets the criteria of Group 7, Value Basis Reporting. [DOE O 5000.3B] [EH62dd1]



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- 444. PROGRAM SIGNIFICANT DELAY. Meets the criteria of Group 8, Facility Status. [DOE O 5000.3B] [EH62dd1]
- 445. PROGRAM WORK. Work in a reactor or nonreactor nuclear facility that is accomplished to further the goals of the facility mission and/or the program for which the facility is operated. Program work does not include work that would be required to maintain the facility in a safe shutdown condition, or to accomplish modifications and correct deficiencies required before program work can recommence. [DOE O 5480.31]
- 446. PROGRAMMATIC MANAGEMENT. Functions that include planning and developing the overall program; establishing priorities; providing program technical direction; preparing and defending the program budget; controlling milestones; integrating all components of the program; providing public and private sector policy liaison; expediting interface activities and follow-up actions; and retaining overall accountability for program success. [DOE O 430.1A]
- 447. PROPERTY. All Government-owned or -leased structures and contents for which the Department has responsibility, including: (1) all DOE land, structures, and contents; (2) all leased locations; (3) all other Government property on DOE land or in DOE structures; and (4) other property that occupy DOE land or are in DOE structures. [DOE O 5480.7A] [EH62dd1]
- 448. PROPERTY. See Physical Assets. [DOE O 430.1A]
- 449. PROPERTY, PLANT, AND EQUIPMENT. Tangible assets that meet the capitalization criteria, that are not intended for sale in the ordinary course of operations; and that have been acquired or constructed with the intention of being used, or being available for use by the entity. [Deferred Maint. memo.]
- 450. PROTECTED AREA (PA). A controlled access area encompassed by physical barriers (i.e., walls or fences) used to protect Categories I and II nuclear materials and vital areas. [EH62dd1]
- 451. PYROPHORIC MATERIAL. A material with an autoignition temperature in air at or below 130 degrees F (54.4 degrees C) and 50 percent relative humidity. [DOE-STD-1066-97]

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- 452. QUALIFIED FIRE PROTECTION ENGINEER. A graduate of an accredited engineering curriculum and having completed not less than 4 years of engineering practice, 3 of which shall have been in responsible charge of diverse fire protection engineering work. If not such a graduate, a qualified engineer shall either: demonstrate a knowledge of the principles of engineering and have completed not less than 6 years engineering practice, 3 of which shall have been in responsible charge of diverse fire protection engineering projects; be a registered professional engineer in fire protection; or meet the requirements for a grade 11 or higher Fire Protection Engineer as defined by the Office of Personnel Management.
- 453. QUALIFIED LIFE. The period of time, prior to the start of a design-basis-accident, for which the equipment was demonstrated to meet the design requirements for the specified service condition. [DOE O 5480.EIA] [EH62dd1]
- 454. QUALIFICATION. The generation and maintenance of evidence to assure that equipment will operate on demand to meet the system performance requirements. [EH62dd1]
- 455. QUALITY. The condition achieved when an item, service, or process meets or exceeds the user's requirements and expectations. [10 CFR 830.3]
- 456. QUALITY ASSURANCE. All those actions that provide confidence that quality is achieved. [10 CFR 830.3]
- 457. QUALITY ASSURANCE PROGRAM (QAP). The overall program or management system established to assign responsibilities and authorities, define policies and requirements, and provide for the performance and assessment of work. [10 CFR 830.3]
- 458. QUALITY FACTOR. The modifying factor used to calculate the dose equivalent from the absorbed dose; the absorbed dose (expressed in rad or gray) is multiplied by the appropriate quality factor (Q). [10 CFR 835.2]
- 459. RADIATION. Ionizing radiation: alpha particles, beta particles, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. Radiation as used in this part, does not include non-ionizing radiation, such as radio- or micro-waves, or visible, infrared, or ultraviolet light. [10 CFR 835.2]

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- 460. RADIATION AREA. Any area accessible to individuals in which radiation levels could result in an individual receiving a deep dose equivalent in excess of 0.005 rem (0.05 millisievert) in 1 hour at 30 centimeters from the source or from any surface that the radiation penetrates. [10 CFR 835.2]
  
- 461. RADIOLOGICAL AREA. Any area within a controlled area defined in 10 CFR 835 as a “radiation area,” “high radiation area,” “very high radiation area,” “contamination area,” “high contamination area,” or “airborne radioactivity area.” [10 CFR 835.2]
  
- 462. RADIOLOGICAL WORKER. A general employee whose job assignment involves operation of radiation producing devices or working with radioactive materials, or who is likely to be routinely occupationally exposed above 0.1 rem (0.001 sievert) per year total effective dose equivalent. [10 CFR 835.2]
  
- 463. RANDOM TESTING. The unscheduled, unannounced urine drug testing of randomly selected individuals in testing designated positions, by a process designed to ensure that selections are made in a non-discriminatory manner. [10 CFR 707.4]
  
- 464. REACTOR. Any apparatus that is designed or used to sustain nuclear chain reactions in a controlled manner such as research, test, and power reactors, and critical and pulsed assemblies and any assembly that is designed to perform subcritical experiments that could potentially reach criticality; and unless modified by words such as containment, vessel, or core, refers to the entire facility, including the housing, equipment and associated areas devoted to the operation and maintenance of one or more reactor cores. [10 CFR 830.3]
  
- 465. REACTOR OPERATOR. A person certified by contractor nuclear facility management to operate (manipulate the controls of) a DOE-owned reactor. [DOE O 5480.20A]
  
- 466. READINESS ASSESSMENT. A review that is conducted to determine a facility's readiness to startup or restart when an Operational Readiness Review is not required. [DOE O 5480.31] [EH62dd1]
  
- 467. REAL PROPERTY. Land (including improvements on the land); facilities (including buildings and other structural facilities), and personal property that is an integral part of real property (related personal property) or is related to, designed

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for, or specifically adapted to the functional or productive capacity of the real property, the removal of which would significantly diminish the economic value of the real property or the related personal property itself. Examples of related personal property are communication systems and telephone systems. Real property may also include triple-wide trailers or modular units joined together so that the structure is not portable and cannot be relocated without being dismantled and thus losing its identity. Normally, common-use items, including but not limited to general-purpose furniture, utensils, office machines, office supplies, and general-purpose vehicles, are not considered related personal property. [Deferred Maint. memo.]

- 468. REASONABLE SUSPICION. A suspicion based on an articulable belief that an employee uses illegal drugs, drawn from particularized facts and reasonable inferences from those facts, as detailed further in § 707.10. [10 CFR 707.4]
- 469. RECORD. A completed document or other media that provides objective evidence of an item, service, or process. [10 CFR 830.3]
- 470. REDUNDANT FIRE PROTECTION SYSTEM. A fire protection system that is designated and installed to function in the event of the failure of a primary fire protection system. Where redundant fire protection systems are specified, any two of the following are considered satisfactory:
  - A. Automatic suppression systems, such as fire sprinklers, foam, gaseous, explosion suppression, or other specialized extinguishing systems plus appropriate alarms. An adequate supply, storage, and distribution system is an essential element.
  - B. Automatic fire detection, occupant warning, manual fire alarm, and fire alarm reporting systems (considered together) combined with a sufficiently-staffed, property-equipped and adequately-trained fire department or brigade that are able and committed to respond in a timely and effective manner.
  - C. Fire barrier systems or combinations of physical separation and barriers for outdoor locations.
  - D. Other systems, such as alternate process control systems, as approved by the Authority Having Jurisdiction.

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Redundant fire protection systems may include dual water supplies to sprinkler systems, dual piping risers, or valving systems such that adequate redundancy in water supply by the sprinkler heads is provided to cover maintenance or emergency outages of either of the water supply systems or may include multiple types of automatic fire suppression systems (e.g., water sprinklers and a gaseous fire suppression system).

Portable fire extinguishers, interior fire hose systems, or interior fire detection and alarm systems do not meet the definition of a redundant fire protection system. [DOE-STD-1066-97]

- 471. REFERRAL. The direction of an individual toward an employee assistance program or to an outside treatment facility by the employee assistance program professional, for assistance with prevention of illegal drug use, treatment, or rehabilitation from illegal drug use or other problems. Referrals to an employee assistance program can be made by the individual (self-referral), by contractor supervisors or managers, or by a bargaining unit representative. [10 CFR 707.4]
- 472. REGULATED AREA. An area demarcated by the responsible employer in which the airborne concentration of beryllium exceeds, or can reasonably be expected to exceed, the action level. [10 CFR 850.3]
- 473. REGULATIONS. DOE regulations are the documents by which DOE establishes binding requirements of general applicability. DOE regulations are adopted pursuant to the Administrative Procedures Act. While they are related to and consistent with DOE directives documents and, in particular, DOE policy statements, they are separate from the DOE directives system. DOE is currently promulgating a set of nuclear safety regulations which are based on statutory authority and do not require any additional authority to be applicable to activities performed in connection with a DOE nuclear facility. When promulgated and published in the Code of Federal Regulation (CFR), these regulations will be subject to the provisions of 10 CFR Part 820, "Procedural Rules for DOE Nuclear Activities." These regulations will implement the DOE directive on nuclear safety policy. [EH62dd1]
- 474. REHABILITATION. A formal treatment process aimed at the resolution of behavioral-medical problems, including illegal drug use, and resulting in such resolution. [10 CFR 707.4]

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475. RELATED PERILS. Aspects of the following as they relate to fire protection: explosion, natural phenomenon, smoke, and water damage. [DOE O 5480.7A] [EH62dd1]
476. RELEASE. Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or otherwise disposing of substances into the environment. This includes abandoning/discarding any type of receptacle containing substances in an unenclosed containment structure. [EH62dd1]
477. RELIABILITY CENTER MAINTENANCE (RCM). A proactive systematic decision logic tree approach to identify or revise preventive maintenance tasks or plans to preserve or promptly restore operability, reliability and availability of facility structures, systems, and components; or to prevent failures and reduce risk through types of maintenance action and frequency selection to ensure high performance. Reliability center maintenance is the performance of scheduled maintenance for complex equipment, quantified by the relationship of preventive maintenance to reliability and the benefits of reliability to safety and cost reduction through the optimization of maintenance task/frequency intervals. The concept relies on empirical maintenance task/frequency intervals to make determinations about real applicable data suggesting an effective interval for task accomplishment. The approach taken to establish a logical path for each functional failure is that each functional failure, failure effect, and failure cause be processed through the logic so that a judgement can be made as to the necessity of the task, and includes: (1) reporting preventive maintenance activities, plans and schedules; (2) optimizing/calculating the preventive maintenance interval by balancing availability, reliability and cost; (3) ranking preventive maintenance tasks; (4) accessing preventive maintenance information from plant and instrument drawings (P&IDs); (5) accessing preventive maintenance and other maintenance data; (6) listing recurring failure modes/parts, including failure to start and failure to run; (7) calculating and monitoring structure, system, and component availability; (8) accessing preventive maintenance procedures, and (9) keeping track of preventive maintenance cost. [DOE-STD-1050-93]
478. REMEDY. Any action necessary or appropriate to rectify, prevent, or penalize a violation of the Act, a Nuclear Statute, or a DOE Nuclear Safety Requirements, including the assessment of civil penalties, the requirement of specific actions, or the modification, suspension or rescission of a contract. [10 CFR 820.2]

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479. REPORTABLE OCCURRENCE. An event or condition to be reported in accordance with the criteria defined in this Order. [DOE O 5000.3B] [EH62dd1]
480. REPORTABLE QUANTITY. Any Comprehensive Environmental Response Compensation and Liability Act hazardous substances, including radionuclides and Superfund Amendments and reauthorization Act Title 3 extremely hazardous substances, with quantities established in 40 CFR Part 302 and Part 355 respectively, release of which requires notification unless Federally permitted. [DOE M 232.1-1A]
481. REPRESENTATIVE. As applied to the sampling of radioactive material, sampling in such a manner that the sample closely approximates both the amount of activity and the physical and chemical properties of the material (e.g., particle size and solubility in the case of air sampling of the aerosol to which workers may be exposed).
482. REQUIREMENTS VERIFICATION ANALYSIS. A validation technique that determines whether the logical flow of data from analysis to conclusions and judgements of need is based on facts. This technique is conducted after all analyses are completed. [DOE G 225.1A-1]
483. RESPONDENT. Any person to whom the Director addresses a Notice of Violation. [10 CFR 820.2]
484. RESPONSIBLE CONTRACTOR. The organization with contractual responsibility for carrying out program work at a government owned facility. [DOE O 5480.31] [EH62dd1]
485. RESPONSIBLE EMPLOYER.
- A. For DOE contractor employees, the DOE contractor office that is directly responsible for the safety and health of DOE contractor employees while performing a beryllium activity or other activity at a DOE facility; or
  - B. For DOE employees, the DOE office that is directly responsible for the safety and health of DOE Federal employees while performing a beryllium activity other activity at a DOE facility; and
  - C. Any person acting directly or indirectly for such office with respect to terms and conditions of employment of beryllium-associated workers.

[10 CFR 850.3]

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486. RESPONSIBLE SECRETARIAL OFFICER. Means the Assistant Secretary or equivalent DOE official who has primary responsibility for a nuclear facility owned by DOE or located on a DOE site. [draft rule -- 10 CFR 830]
487. RESPONSIBILITY. The state of being liable for the outcome of the exercise of an authority granted by law, regulation, or directive. Responsibility cannot be delegated although the associated authority may be. [DOE M 411.1-1A]
488. RESTART. Recommence reactor critical operations and/or program work in nuclear facilities. [DOE O 5480.31] [EH62dd1]
489. RISK. The quantitative or qualitative expression of possible loss that considers both the probability that a hazard will cause harm and the consequences of that event. [DOE O 5480.30]
490. RISK-INFORMED. Using knowledge of the risk. [ISMS Guide]
491. ROOT CAUSE. The causal factors preceding structures, systems, and components (SSC) failure or malfunction - that is, discovery of the principal reason why the failure or malfunction happened leads to the identification of the root cause. The preceding failure or malfunction causal factors are always events or conditions that are necessary and sufficient to produce or contribute to the unwanted results (failure or malfunction). The types of causal factors are: (1) direct causes, (2) contributing causes, and (3) root causes. The direct cause is the immediate event or condition that caused the failure or malfunction. Contributing causes are conditions or events that collectively increase the likelihood of the failure or malfunction, but that individually do not cause them. Thus, root causes are events or conditions that, if corrected or eliminated, would prevent the recurrence of the failure or malfunction by identifying and correcting faults (often hidden) before an SSC fails or malfunctions. [DOE-STD-1050-93]
492. ROOT CAUSE ANALYSIS. Any methodology that identifies the causal factors that, if corrected, would prevent recurrence of the accident. [DOE G 225.1A-1]
493. SAFETY ANALYSIS. A documented process:
- A. to provide systematic identification of hazards within a given DOE operation;
  - B. to describe and analyze the adequacy of the measures taken to eliminate, control, or mitigate identified hazards; and



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C. to analyze and evaluate potential accidents and their associated risks.  
[DOE O 5480.30]

- 494. SAFETY ANALYSIS REPORT (SAR). That report which documents the safety analysis for a nuclear facility to provide the basis for a determination that the facility can be constructed, operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and regulations.
- 495. SAFETY ANALYSIS REPORT (SAR). That report which documents the adequacy of safety analysis to ensure that the facility can be constructed, operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and standards. [DOE O 5480.23] [EH62dd1] [DOE IG-420.1.4]
- 496. SAFETY BASIS. The documented safety analysis and hazard controls that provide reasonable assurance that a DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment. [10 CFR 830.3]
- 497. SAFETY BASIS. The combination of information relating to the control of hazards at a nuclear facility (including design, engineering analyses, and administrative controls) upon which DOE depends for its conclusion that activities at the facility can be conducted safely. [DOE O 5480.30]
- 498. SAFETY CLASS MONITORING EQUIPMENT. Equipment/instrumentation necessary to monitor the parameters necessary to assess facility and environs conditions during and following an accident both on site and off-site. [DOE O 5480.EQ] [EH62dd1]
- 499. SAFETY CLASS STRUCTURES, SYSTEMS AND COMPONENTS. The structures, systems, or components, including portions of process systems, whose preventive or mitigative function is necessary to limit radioactive hazardous material exposure to the public, as determined from safety analysis. [10 CFR 830.3]
- 500. SAFETY-CLASS STRUCTURES, SYSTEMS, AND COMPONENTS (SAFETY-CLASS SSCs). Systems, structures, or components including primary environmental monitors and portions of process systems, whose failure could adversely affect the environment, or safety and health of the public as identified by safety analyses.

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For the purpose of implementing DOE-STD-3009-94, the phrase “adversely affect” means Evaluation Guidelines are exceeded. Safety-class SSCs are systems, structures, or components whose preventive or mitigative function is necessary to keep hazardous material exposure to the public below the offsite Evaluation Guidelines. The definition would typically exclude items such as primary environmental monitors and most process equipment. [DOE 5480.30] [DOE-STD-3009-94]

501. SAFETY CONTROLS. Safety significant controls or safety class controls (see also administrative controls). [ISMS Guide]
502. SAFETY DOCUMENTATION. Reports, memoranda, and other signed and dated documents that identify the hazards of a process or facility and describe measures for their control. (See DOE O 5480.23.)
503. SAFETY ENVELOPE. The range of conditions covered by the safety documentation of a process or facility under which safe operation is adequately controlled. [ISMS Guide]
504. SAFETY EVALUATION. A safety evaluation is that record required by DOE O 5480.21 to document the review of a "change." This document records the scope of the evaluation and the logic for determining whether or not an Unreviewed Safety Question exists. [DOE O 5480.21] [EH62dd1]
505. SAFETY EVALUATION REPORT. The report prepared by DOE to document
  - A. The sufficiency of the documented safety analysis for a hazard category 1, 2, or 3 DOE nuclear facility;
  - B. The extent to which a contractor has satisfied the requirements of Subpart B of 10 CFR Part 830; and
  - C. The basis for approval by DOE of the safety basis for the facility, including any conditions for approval.[10 CFR 830.3]
506. SAFETY EVALUATION REPORT (SER). A DOE document that describes the extent and detail of DOE review of a Safety Analysis Report (SAR) or equivalent analysis report, the bases for approving the SAR (or equivalent), and any conditions of SAR (or equivalent) approval. Approval signifies that DOE has

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accepted the analysis as appropriately documenting the safety basis of a facility and as serving as the basis for operational controls necessary to maintain an acceptable operating safety envelope. [DNFSB mandated] [ISMS Guide]

- 507. SAFETY/IMPLEMENTATION GUIDES. DOE Safety and implementation guides, part of the DOE directives system, are issued to provide supplemental information regarding the Department's expectations on specific provisions of Orders and regulations and may identify acceptable methods for implementing those provisions. Guides may identify acceptable implementation of requirements by referencing Government or non-Government standards. Safety and implementation guides are not substitutes for regulations or Orders. Although these guides must be considered in establishing the safety basis for a facility, reasonable opportunity must always be given to demonstrate compliance by actions other than those set forth in the guide. If an action in a DOE guide is included explicitly in a contract or a plan required by a contract or DOE regulation, then an enforceable obligation may be created. [DOE N 1321.138] [EH62dd1]
- 508. SAFETY LIMITS. The limits on process variables associated with those safety class physical barriers, generally passive, that are necessary for the intended facility function and that are required to guard against the uncontrolled release of radioactive materials. [10 CFR 830.3]
- 509. SAFETY LIMIT (SL). A limit on process variables associated with those passive physical barriers that are necessary for the intended facility function and that are required to guard against the uncontrolled release of radioactive or other hazardous materials. [DOE O 5480.22]
- 510. SAFETY MANAGEMENT FUNCTION. An activity that may beneficially affect the safety and health of workers or the public or the protection of the environment.
- 511. SAFETY MANAGEMENT PROGRAM. A program designed to ensure to facility is operated in a manner that adequately protects workers, the public, and the environment by covering a topic such as: quality assurance; maintenance of safety systems; personnel training; conduct of operations; inadvertent criticality protection; emergency preparedness; fire protection; waste management; or radiological protection of workers, the public, and the environment. [10 CFR 830.3]

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- 512. SAFETY MANAGEMENT SYSTEM. An integrated safety management system established consistent with 48 CFR 970.5223-1. [10 CFR 830.3]
- 513. SAFETY MANAGEMENT SYSTEM (SYSTEM). Means an integrated safety management system developed in accordance with the provisions of Department of Energy Acquisition Regulations in 48 CFR 970.5204-2 (also described in the DOE P 450.4, "Safety Management System Policy," issued on October 15, 1996). [48 CFR 970.5204-2]
- 514. SAFETY MANAGEMENT SYSTEMS, AND COMPONENTS. The structures, systems, and components which are not designed as safety class structures, systems, and components, but whose preventive and mitigative function is a major contributor to defense in depth and/or worker safety as determined from safety analysis [10 CFR 830.3]
- 515. SAFETY PROGRAMS. Programs, required by DOE or other regulatory authority or committed to in the contractor's Safety Management System description, that will be adhered to for a scope of work by a facility or site in support of the work. [Generalized from DNFSB input to apply to non-nuclear facilities] [ISMS Guide]
- 516. SAFETY SIGNIFICANT STRUCTURES, SYSTEMS, AND COMPONENTS. The structures, systems, and components which are not designed as safety class structures, systems, and components, but whose preventive and mitigative function is a major contributor to defense in depth and/or worker safety as determined from safety analysis [10 CFR 830.3]
- 517. SAFETY SIGNIFICANT STRUCTURES, SYSTEMS, AND COMPONENTS (SAFETY-SIGNIFICANT SSCs). Structures, systems, and components not designated as safety-class SSCs but whose preventive or mitigative function is a major contributor to defense in depth (i.e., prevention of uncontrolled material releases) and/or worker safety as determined from hazard analysis. [DOE –STD-3009-94]
- 518. SAFETY STRUCTURES, SYSTEMS, AND COMPONENTS. Both safety class structures, systems, and components and safety significant structures, systems, and components. [10 CFR 830.3]

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- 519. SAFETY STRUCTURES, SYSTEMS, AND COMPONENTS (SAFETY SSCs). The set of safety-class structures, systems, and components, and safety-significant structures, systems, and components for a given facility. [DOE-STD-3009-94]
- 520. SAMPLE EQUIPMENT. Equipment, representative of a design, used to obtain data that are valid over a range of ratings and for specific service conditions (environmental sampling equipment, e.g., split spoon samplers) are not encompassed by this definition. [DOE O 5480.EIA] [EH62dd1]
- 521. SECONDARY ENVIRONMENTAL MONITORS. Environmental monitoring equipment or activities which, if degraded, will produce a more than minor disruption of a monitoring program. An example of a minor effect would be the failure of a unit whose place in the program is effectively duplicated by overlap between one or more other components. An example of a more than minor effect would be the failure of sufficient units to preclude continued coverage, or the failure of a unit which provides the only coverage for large areas, such as a groundwater monitoring well. [DOE O 5000.3B] [EH62dd1]
- 522. SECRETARIAL OFFICER (SO). The head of a first-tier organization; a DOE Headquarters employee reporting directly to the Secretary, the Under Secretary, or the Deputy Secretary. [DOE M 411.1-1A]
- 523. SECRETARIAL OFFICER (SO). The Assistant Secretary or Office Director who is primarily responsible for the conduct of an activity under the Act. With regard to activities and facilities covered under E.O. 12344, 42 U.S.C. 7158 note, pertaining to Naval nuclear propulsion, Secretarial Officer shall mean the Deputy Assistant Secretary for Naval Reactors. [10 CFR 820.2]
- 524. SECRETARY. The Secretary of Energy or his designee. [10 CFR 820.2]
- 525. SELF-ASSESSMENT. A systematic evaluation of a facility maintenance program, including the activities and practices, utilizing the performance objectives and criteria from each element of the Maintenance Management Program defined in Chapter 1 of DOE O 4330.4A. [DOE O 4330.4A] [EH62dd1]
- 526. SENIOR INDUSTRIAL HYGIENIST. A person who is certified in the practice of industrial hygiene or who meets the American Board of Industrial Hygiene's (ABIH's) requirements for eligibility to take the examinations for certification. At a minimum, such individuals must have a college or university degree in industrial

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hygiene; chemistry; physics; chemical, mechanical, or sanitary engineering; medicine; or biology, special studies and training, and 5 years of full-time employment in the professional practice of industrial hygiene. (See the ABIH Bulletin for detailed requirements for certification or eligibility for certification.) [DOE O 5480.10A (Draft)] [DOE G 440.1-3]

- 527. SENIOR MANAGEMENT. The manager or managers responsible for mission accomplishment and overall operations. For the DOE, the DOE PSOs and field/Operations Office Managers are responsible for mission accomplishment and overall operations. For DOE Management and Operating contractors, the General Manager, or similar top position is responsible for mission accomplishment and overall performance in accordance with the requirements of their contracts or other agreements. [DOE O 5700.6C] [EH62dd1]
- 528. SENIOR OPERATIONAL READINESS REVIEW TEAM MEMBERS. Members of the Operational Readiness Review Team which include as a minimum, the Operational Readiness Review team leader, senior nuclear safety experts, and other supervisory or advisory personnel who draft the Operational Readiness Review Implementation Plan, oversee and review the activities of other team members or materially assist the Operational Readiness Review team leader in developing the final Operational Readiness Review report. [DOE O 5480.31] [EH62dd1]
- 529. SENIOR REACTOR OPERATOR. A person certified by contractor nuclear facility management to operate and direct the operation of a DOE-owned reactor. [DOE O 5480.20A]
- 530. SERVICE. The performance of work, such as design, manufacturing, construction, fabrication, assembly, documentation, environmental, restoration, waste management, laboratory sample analysis, inspection, nondestructive examination/testing, environmental qualification, equipment qualification, repair, installation, or the like. [10 CFR 830.3]
- 531. SERVICE CONDITIONS. Environmental, loading, power, and signal conditions expected as a result of normal operating requirements, expected extremes (abnormal) in operating requirements, and postulated conditions appropriate for the design basis events of the facility. [DOE O 5480.EIA] [EH62dd1]

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- 532. SERVICE ENVIRONMENT. Actual physical states, environment, or influences that exist during the service life of a system, structure, or component. [EH62dd1]
- 533. SHALL, SHOULD, AND MAY. Shall is used to denote a requirement; should is used to denote a recommendation; and may is used to denote permission, neither a requirement nor a recommendation. [DOE O 5480.20A] [EH62dd1]
- 534. SHALLOW DOSE EQUIVALENT. The dose equivalent deriving from external radiation at a depth of 0.007 cm in tissue. [10 CFR 835.2]
- 535. SHIFT SUPERVISOR. A certified person in the operating organization designated by contractor facility management to direct operations-related activities of personnel at a DOE-owned reactor or nonreactor nuclear facility. Substitute titles may be used for positions of equivalent functions. [DOE O 5480.20A]
- 536. SHIFT TECHNICAL ADVISOR (STA). A person who has been assigned to provide on-shift advice and counsel to shift operating personnel to help determine cause and mitigation of facility accidents. [DOE O 5480.20A]
- 537. SHORT-TERM EXPOSURE LIMIT (STEL). A 15-minute time-weighted average (TWA) exposure which shall not be exceeded at any time during a workday even if the 8-hour TWA is within limits. [DOE O 5480.10A (Draft)]
- 538. SIGNIFICANT MODIFICATION. A change to a nuclear facility that involves an Unreviewed Safety Question, as defined below. [DOE O 5480.5] [EH62dd1]
- 539. SIGNIFICANT QUANTITY OF FISSIONABLE MATERIALS. The minimum quantity of fissionable material for which control is required to maintain subcriticality under all normal and credible abnormal conditions. [DOE O 420.1A] [DOE G 830.330, Rev. 2]
- 540. SITE. Area comprising or within a DOE laboratory or complex with one or more DOE facilities. [DOE IG-420.1.4]
- 541. SITE BOUNDARY. A well-marked boundary of the property over which the owner or operator can exercise strict control without the aid of outside authorities. [DOE O 5480.30] [EH62dd1]

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542. SITE OCCUPATION MEDICAL DIRECTOR (SOMD). The physician responsible for the overall direction and operation of the site occupational medicine program. [10 CFR 850.3]
543. SKILL OF THE CRAFT. The level of technical proficiency of a worker that is verifiable through some form of qualification or supervisory knowledge. [Charles Ramsey, EH-31, 1998]
544. SMOKE DEVELOPED RATING. Smoke developed rating is a numerical classification determined by American Society of Testing and Material standard ASTM E-84, which indexes the smoke generation rate of a given material to those of two standard materials (inorganic reinforced cement board and select grade red oak). [DOE-STD-1066-97]
545. SPECIAL NUCLEAR MATERIAL. (1) Plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Nuclear Regulatory Commission, pursuant to the provisions of section 51, determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material. [10 CFR 707.4]
546. SPECIMEN CHAIN OF CUSTODY FORM. A form used to document the security of the specimen from time of collection until receipt by the laboratory. This form, at a minimum, shall include specimen identifying information, date and location of collection, name and signature of collector, name of testing laboratory, and the names and signatures of all individuals who had custody of the specimen from time of collection until the specimen was prepared for shipment to the laboratory. [10 CFR 707.4]
547. STAGING BAYS (IN-PROCESS). A bay(s) within an operating building used to stage explosives in excess of 4 hours supply. This practice is permissible as long as the bay(s) is designed to provide Class II level of protection. [DOE O 6430.1A]
548. STANDARD.
- A. The term "standard," or "technical standard" as cited in Public Law 104-113, includes all of the following:



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1. Common and repeated use of rules, conditions, guidelines or characteristics for products or related processes and production methods, and related management system practices.
  2. The definition of terms; classification of components; delineation of procedures; specification of dimensions, materials, performance, designs, or operations; measurement of quality and quantity in describing materials, processes, products, systems, services, or practices; test methods and sampling procedures; or descriptions of fit and measurements of size or strength.
- B. The term "standard" does not include the following:
1. Professional standards of personal conduct.
  2. Institutional codes of ethics.
- C. "Performance standard" is a standard as defined above that states requirements in terms of required results with criteria for verifying compliance but without stating the methods for achieving required results. A performance standard may define the functional requirements for the item, operational requirements, and/or interface and interchangeability characteristics. A performance standard may be viewed in juxtaposition to a prescriptive standard which may specify design requirements, such as materials to be used, how a requirement is to be achieved, or how an item is to be fabricated or constructed.
- D. "Non-government standard" is a standard as defined above that is in the form of a standardization document developed by a private sector association, organization or technical society which plans, develops, establishes or coordinates standards, specifications, handbooks, or related documents.

[Office of Management and Budget Circular A-119]

549. STANDBY POWER. A reserve power generation or supply with switching devices that will supply power to selected loads in the event of a normal power failure. It is not required to have redundant equipment or to operate through events greater than the Uniform Building Code. A standby power system shall not be classified a safety system. [DOE O 6430.1A]

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- 550. STOCHASTIC EFFECTS. Malignant and hereditary diseases for which the probability of an effect occurring, rather than its severity, is regarded as a function of dose without a threshold for radiation protection purposes. [10 CFR 835.2]
- 551. STRUCTURAL COLLAPSE. The failure of a structural component as a direct result of loss of structural integrity of the nuclear facility being subjected to various loadings. [DOE O 5480.30] [EH62dd1]
- 552. SUMMARIZED EMPLOYEE CONCERNS. A non-classified summary or other brief report of an employee's concern which does not contain the employee's name or other information which could identify the employee. [DOE O 5480.29] [EH62dd1]
- 553. SUPPLIER. The organization which furnishes items or services. An all inclusive term used in place of any of the following: vendor, seller, contractor, subcontractor, fabricator, distributor, consultant, or subtier suppliers. [DOE O 5000.3B] [EH62dd1]
- 554. SUPPORT OFFICE. A DOE organization that provides administrative, legal, technical, independent oversight, policy, and standards support to program offices for safety management functions. Examples of Headquarters support offices include those that report to the Assistant Secretaries for Environment, Safety and Health, the Office of Management and Administration, and the Office of General Counsel. [DOE M 411.1-1A]
- 555. SURVEILLANCE. Any periodic monitoring to ensure operability or adequacy of performance. [ISMS Guide] [EH62dd]
- 556. SURVEILLANCE AND MAINTENANCE. These activities are conducted through-out the facility life cycle phase including when a facility is not operating and is not expected to operate again and continues until phased out during decommissioning. Activities include providing in a cost effective manner periodic inspections and maintenance of structures, systems and equipment necessary for the satisfactory containment of contamination and protection of workers, the public and the environment. [DOE O 430.1A]
- 557. SERVEILLANCE REQUIREMENTS. Requirements relating to test, calibration, or inspection to ensure that the necessary operability and quality of safety structures, systems, and components and their support systems required for safe

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operations are maintained, that facility operation is within safety limits, and the limiting control settings and limiting conditions for operation are met. [10 CFR 830.3]

- 558. SURVEILLANCE REQUIREMENT (SR). A requirement relating to test, calibration, or inspection that ensures that the necessary operability and quality of safety structures, systems, and components and their support systems required for the safe operation of a facility is maintained. [DOE O 5480.22]
- 559. SURVEY. An evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation. When appropriate, such an evaluation includes a physical survey of the location of radioactive material and measurements or calculations of levels of radiation, or concentrations or quantities of radioactive material present.
- 560. SYNERGISTIC EFFECTS. The results of two or more process variables acting in such a way that the resultant total effect is greater than the sum of the effects when taken independently. [EH62dd1]
- 561. SYSTEMATIC APPROACH TO TRAINING (SAT). A training program that includes the following five elements:
  - A. Systematic analysis of the jobs to be performed;
  - B. Learning objectives derived from the analysis which describes performance after training;
  - C. Training design, development, and implementation based on the learning objectives;
  - D. Evaluation of trainee mastery of the objectives during training; and
  - E. Evaluation and revision of the training based on the performance of trained personnel in the job setting.

[DOE G 830.330, Rev. 2]

- 562. TAILORED SET. Means a set of tailored requirements relating to nuclear safety management developed in accordance with paragraph (c) of 48 CFR 970.5204-78

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through the use of a tailoring process included in a safety management system approved pursuant to 48 CFR 970.5204-2. Such a set shall identify in a clear and concise manner all requirements contained therein, including applicable regulatory requirements, and shall specify applicable regulatory requirements for which a request for appropriate regulatory relief is recommended. [48 CFR 970.5204-2]

- 563. TAILORING. Adapting something, such as a safety program, practice, or requirement, within the integrated Safety Management System to suit the need or purposes of a particular operation/activity, taking into account the type of work and associated hazards. [ISMS Guide]
- 564. TARGET. A person, object, or animal upon which an unwanted energy flow may act to cause damage, injury, or death. [DOE G 225.1A-1]
- 565. TASK. A well-defined unit of work having an identifiable beginning and end which is a measurable component of the duties and responsibilities of a specific job. [DOE O 5480.20A]
- 566. TASK ANALYSIS. The systematic process of examining a task to identify skills, knowledge, and/or abilities required for successful task performance. [DOE O 5480.20A]
- 567. TECHNICAL SAFETY APPRAISALS (TSAs). Documented, multidisciplined appraisals of selected Department reactors and non-reactor nuclear facilities. TSAs ensure proper Department-wide application of particular safety elements of the Environment, Safety and Health program, nuclear industry lessons learned, and appropriate licensed facility requirements as described in DOE Order 5482.IB. [DOE O 5480.5] [EH62dd1]
- 568. TECHNICAL SAFETY REQUIREMENTS (TSRs). Those requirements that define the conditions, safe boundaries, and the management or administrative controls necessary to ensure the safe operation of a nuclear facility and to reduce the potential risk to the public and facility workers from uncontrolled releases of radioactive materials or from radiation exposures due to inadvertent criticality. Technical Safety requirements consist of safety limits, operating limits, surveillance requirements, administrative controls, use and application instructions, and the basis thereof. [DOE O 5480.22]

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- 569. TECHNICAL SAFETY REQUIREMENTS (TSRs). The limits, controls, and related actions that establish the specific parameters and requisite actions for the safe operation of a nuclear facility and include, as appropriate for the work and the hazards identified in the documented safety analysis for the facility: Safety limits, operating limits, surveillance requirements, administrative and management controls, use and application provisions, and design features, as well as a bases appendix. [10 CFR 830.3]
  
- 570. TECHNICAL WORK ACTIVITIES. The engineering, design, computer support, training, warehousing, fabrication, procurement, operations, quality assurance, material and parts control and availability, specialized inspections, planning, or other such support needed to develop and implement a successful maintenance management program that provides an efficient and continuous operating DOE nuclear facility. [As Technical Support in DOE-STD-1050-93]
  
- 571. TECHNICAL VALIDATION. Process of providing reasonable assurance that the retrieved design information is technically appropriate and correct. Technical Validation includes determining the appropriateness of methods and assumptions. [EH62dd1]
  
- 572. TEMPORARY EXEMPTION. A short-term release from a nuclear safety requirement. [DOE O 5480.24] [EH62dd1]
  
- 573. TESTING DESIGNATED POSITION. A position whose incumbents are subject to drug testing under this part. [10 CFR 707.4]
  
- 574. THRESHOLD LIMIT VALUES (TLVs). Airborne concentrations of substances or levels of physical agents, and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse health effects. TLVs are issued by the American Conference of Governmental Industrial Hygienists (ACGIH). [DOE 5480.10A (Draft)]
  
- 575. TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE). The sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures). [10 CFR 835.2]
  
- 576. TOXIC/POISONOUS CHEMICALS. A substance that through its chemical action is capable of killing, injuring, or impairing an organism. [DOE O 5480.EIA]. [EH62dd1]

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577. TRAINING. Instruction designed to develop or improve job performance. [DOE G 830.330, Rev. 2][DOE O 5480.20A]
578. TRAINING IMPLEMENTATION MATRIX. A matrix prepared by the operating organization which defines and describes the application of the selection, qualification, and training requirements of this Order. This matrix includes any exceptions taken for requirements which are not implemented. [DOE O 5480.20A] [EH62dd1]
579. TRAINING PROGRAM. A planned, organized sequence of activities designed to prepare individuals to perform their jobs, to meet a specific position or classification need, and to maintain or improve their performance on the job. [DOE G 830.330, Rev. 2] [DOE O 5480.20A]
580. TRANSPORTATION EVENT. Any real-time occurrence involving any of the following transportation activities: material classification, packaging, marking, labeling, placarding, shipping paper preparation, loading/unloading, separation/segregation, blocking and bracing, routing, accident reporting, and movement of materials. Transportation events with injury(ies) may also require reporting in accordance with Group 3 criteria.
- A. OFFSITE TRANSPORTATION EVENT. This event involves movement of materials which are considered to be in commerce, thus requiring compliance with U.S. Department of Transportation Hazardous Materials Regulations.
- B. ONSITE TRANSPORTATION EVENT. This event involves movements of materials that are not in commerce, thus are transported in accordance with DOE onsite safety requirements. [DOE O 5000.3B] [EH62dd1]
581. TRANSURANIC (TRU) ELEMENTS. Those elements having an atomic number greater than 92 (uranium). [DOE O 6430.1A]
582. TRU WASTE. Without regard to source or form, radioactive waste that, at the end of institutional control periods, is contaminated with alpha-emitting TRU radionuclides with half-lives greater than 20 years and concentrations greater than 100 nCi/g. [DOE O 6430.1A]

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- 583. TRANSURANIC WASTE. Transuranic waste is radioactive waste containing more than 100 nanocuries (3700 becquerel) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) high-level radioactive waste, (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. [Source: WIPP Land Withdrawal Act of 1992, as amended] [DOE M 435.1-1]
  
- 584. TSR BASES. A summary description of how the numerical values, operating limits, and surveillances are derived from and satisfy the purposes described in the safety analysis report. [Richard Englehart, EH-31, Interpretation from DOE O 5480.22 (1999)]
  
- 585. TSR DESIGN FEATURES. The passive design features of a facility that, if altered, or modified, would have a significant effect on the safe operation of the facility. [DOE O 5480.22]
  
- 586. UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION. Certain unclassified Government information prohibited from unauthorized dissemination under Section 148 of the Atomic Energy Act. [DOE O 4330.4A] [EH62dd1]
  
- 587. UNDUE RISK. A level of identifiable risk that is unacceptable to DOE. [DOE O 5480.5] [EH62dd1]
  
- 588. UNINTERRUPTIBLE POWER SUPPLY (UPS). A power supply that provides automatic, instantaneous power, without delay or transients, on failure of normal power. It can consist of batteries or full-time operating generators. It can be designated as standby or emergency power depending on the application. Emergency installations must meet the requirements specified for emergency power. [DOE O 5480.30] [EH62dd1]
  
- 589. UNINTERRUPTIBLE POWER SUPPLY. A system intended to provide a continuous source of power, without delay or transients, upon degradation or failure of the normal source of power. [DOE-STD-3009-94]

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590. UNIQUE IDENTIFIERS. The part of a paired set of labels, used in records that contain confidential information, that does not identify individuals except by using the matching label. [10 CFR 850.3]
591. UNIRRADIATED ENRICHED URANIUM (UEU). Naturally occurring uranium enriched with U-235 above its natural abundance of approximately 0.71 percent (weight percent) that has not been exposed to a neutron flux. [DOE O 6430.1A]
592. UNPLANNED SHUTDOWN. An unplanned facility shutdown for any cause, such as equipment malfunction, personal error, or onshift operator response to indications of an unsatisfactory situation, or a situation that would have had unsafe consequences without shutdown. Also, an unplanned shutdown directed by contractor management, local DOE officials, or by Headquarters. [DOE O 5480.31] [EH62dd1]
593. UNREVIEWED SAFETY QUESTION (USQ). A situation where The probability of the occurrence or the consequences of an accident or the malfunction of equipment important to safety previously evaluated in the documented safety analysis could be increased;
- A. The possibility of an accident or malfunction of a different type than any evaluated previously in the documented safety analysis could be created;
  - B. A margin of safety could be reduced; or
  - C. The documented safety analysis may not be bounded or may be otherwise inadequate. [10 CFR 830.3]
- [10 CFR 830.3]
594. UNREVIEWED SAFETY QUESTION (USQ) PROCESS. A process to determine when DOE is to be involved in decision making involving a USQ. [Based on DOE O 5480.21] [ISMS Guide]
595. UNREVIEWED SAFETY QUESTION PROCESS. The mechanism for keeping a safety basis current by reviewing potential unreviewed safety questions, reporting unreviewed safety questions to DOE, and obtaining approval from DOE prior to taking any action that involves an unreviewed safety question. [10 CFR 830.3]
596. UPGRADE. A design and construction measure taken to increase the resistance of structures, systems, and components for the effects of natural phenomena hazards.



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Upgrade, strengthening, and retrofit are equivalent terms. [DOE O 5480.28]  
[EH62dd1] [DOE IG-420.1.4]

- 597. USAGE CATEGORY. Those categories defined in University of California Research Laboratory UCRL 15910, which are used to determine design requirements and for evaluation of DOE facilities to survive natural phenomena events. These categories reflect the importance of the facility as to occupant and public safety, continued function, and assurance needed for containment of hazardous materials. [DOE O 6430.1A]
- 598. USE AND APPLICATIONS PROVISIONS. The basis instructions for applying technical safety requirements. [10 CFR 830.3]
- 599. VALIDATION (PROCEDURES). The determination that a procedure is usable and accomplishes the task for which it was written. [EH62dd1]
- 600. VALUE ENGINEERING. An engineering technique that assesses alternatives by considering factors, such as construction and maintenance impacts, as well as operating efficiencies. [DOE O 430.1A]
- 601. VERIFICATION (DESIGN). Process of checking that the retrieved design information is complete and has been accurately translated from the source documents. [EH62dd1]
- 602. VERIFICATION (PROCEDURES). Independent determination that a procedure is technically correct and consistent with the procedures standard (Writer's Guide). [EH62dd1]
- 603. VERY HIGH RADIATION AREA. Any area accessible to individuals in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in one hour at 1 meter from a radiation source or from any surface that the radiation penetrates. [10 CFR 835.2]
- 604. VITAL PROGRAM. A DOE program so defined by the Program Secretarial Officers. [DOE O 5480.7A] [EH62dd1]
- 605. VOLATILE CHEMICALS. Chemicals that can be readily vaporized at a relatively low temperature. [DOE O 5480.EIA] [EH62dd1]

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- 606. WEIGHTING FACTOR ( $W_T$ ). The fraction of the overall health risk, resulting from uniform, whole body irradiation, attributable to specific tissue (T). The dose equivalent to tissue, ( $H_T$ ) is multiplied by the appropriate weighting factor to obtain the effective dose equivalent contribution from that tissue. [10 CFR 835.2]
- 607. WHOLE BODY. For the purposes of external exposure, head, trunk (including male gonads), arms above and including the elbow, or legs above and including the knee. [10 CFR 835.2]
- 608. WORK. Process of performing a defined task or activity, for example, research and development, operations, maintenance and repair, administration, software development and use, inspection, safeguards and security, data collection, and analysis. [EH62add1] [ISMS Guide]
- 609. WORKER. A person who performs work for or on behalf of DOE, including a DOE employee, an independent contractor, a DOE contractor or subcontractor employee, or any other person who performs work at a DOE facility. [10 CFR 850.3]
- 610. WORK CONTROL DOCUMENT. Proceduralized document used by facility personnel to perform maintenance repair, inspections, testing or other work. [DOE-STD-1050-93]
- 611. WORK FOR OTHERS. The performance of work for non-DOE entities by DOE/contractor personnel and/or the utilization of DOE facilities that is not directly funded by DOE appropriations. [ISMA Guide]
- 612. WORK PERFORMANCE. The act of performing work. [ISMS Guide]
- 613. WORK PERFORMED ON-SITE. Work performed within the boundaries of a DOE-owned or – leased facility. However, work will not be considered to be formed “on-site” when pursuant to the contract it is the only work performed within the boundaries of a DOE-owned or –leased facility, and it is ancillary to the primary purpose of the contract (e.g., on-site delivery of goods produced off-site). [10 CFR 708.4]
- 614. WORK PLANNING. The process of planning a defined task or activity. Addressing safety as an integral part of work planning includes execution of the safety-related functions in preparation for performance of a scope of work. These

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functions include (1) definition of the scope of work, (2) formal analysis of the hazards bringing to bear in an integrated manner specialists in both ES&H and engineering depending on specific hazards identified, (3) identification of resulting safety controls including safety structures, systems and components, and other safety-related commitments to address the hazards, and (4) approval of the safety controls. [DNFSB mandated] [ISMS Guide]

615. YEAR. The period of time beginning on or near January 1 and ending on or near December 31 of that same year used to determine compliance with the provisions of this part. The starting and ending date of the year used to determine compliance may be changed provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years. [10 CFR 835.2]

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### 3. GLOSSARY SOURCE LIST

#### A. DOE Policies

DOE P 450.4, "Safety management System Policy."

#### B. DOE Notices

DOE N 1321.138, "Departmental Directives System: Interim Improvement Notice 2 (dated February 16, 1993)"

#### C. DOE Orders

1. DOE O 225.1A, "Accident Investigations"
2. DOE O 430.1 (430.1A), "Life-Cycle Asset Management"
3. DOE O 452.2A, "Safety of Nuclear Explosive Operations"
4. DOE O 1300.2A, "Department of Energy Technical Standards Program"
5. DOE O 4330.4A (4330.4B), "Maintenance Management Program"
6. DOE O 5000.3B, "Occurrence Reporting and Processing of Operating Information"
7. DOE O 5480.EIA, "Environmental Impact Assessment"
8. DOE O 5480.EIS, "Environmental Impact Statement"
9. DOE O 5480.EQ, "Equipment Qualification"
10. DOE O 5480.1B, "Environment, Safety and Health Program for Operations"
11. DOE O 5480.5, "Safety of Nuclear Facilities" (Cancelled Order)
12. DOE O 5480.6, "Safety of DOE-Owned Nuclear Reactors"
13. DOE O 5480.7A, "Fire Protection"
14. DOE O 5480.10A (Draft), "Contractor Industrial Hygiene Program"

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15. DOE O 5480.18B, "Environment, Safety and Health Program for Operations"
16. DOE O 5480.19, "Conduct of Operations Requirements for DOE Facilities"
17. DOE O 5480.20A, "Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities"
18. DOE O 5480.21, "Unreviewed Safety Questions"
19. DOE O 5480.22, "Technical Safety Requirements"
20. DOE O 5480 23, "Nuclear Safety Analysis Reports"
21. DOE O 5480.24, "Nuclear Criticality Safety"
22. DOE O 5480.28, "Natural Phenomena Hazards Mitigation"
23. DOE O 5480.29, "Employee Concerns Management System"
24. DOE O 5480.30, "Nuclear Reactor Safety Design Criteria"
25. DOE O 5480.31, "Startup and Restart of Nuclear Facilities"
26. DOE O 5700.6C, "Quality Assurance"
27. DOE O 6430.1A, "General Design Criteria" (Cancelled Order)

### D. Rules

1. 10 CFR 707.4, "Definitions" from 10 CFR 707, "Workplace Substance Abuse Programs at DOE Sites"
2. 10 CFR 708.4, "Definitions" from 10 CFR 708, "DOE Contractor Employee Protection Program"
3. 10 CFR 820.2, "Definitions" from 10 CFR 820, "Procedural Rules for DOE Nuclear Activities"
4. 10 CFR 830, Rev.0, "Nuclear Safety Management"
5. 10 CFR 830.3, "Definitions" from 10 CFR 830

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6. 10 CFR 835.2, “Definitions” from 10 CFR 835, “Occupational Radiation Protection”
7. 10 CFR 850.3, “Definitions” from 10 CFR 850, “Chronic Beryllium Disease Prevention Program; Final Rule”
8. Federal Acquisition Regulation 1.6, DOE Acquisition Regulation 901.6
9. 48 CFR 970.5204-2, “Integration of Environment, Safety and Health Into Work Planning and Execution.”

### E. Statutes

Public Law 104-113 – March 7, 1996, “National Technology Transfer and Advancement Act of 1995”

### F. Manuals

1. DOE M 232.1-1A, “Occurrence Reporting and Processing of Operations Information”
2. DOE M 411.1-1A, “Manual of Safety Management Functions, Responsibilities, and Authorities”
3. DOE M 435.1-1, “Radioactive Waste Management Manual”
4. DOE M 440.1-1, “DOE Explosives Safety Manual”

### G. Guides

1. DOE G 225.1A-1, “Guide for DOE O 225.1 Accident Investigations”
2. DOE IG-420.1.4, “Interim Guidelines for the Mitigation of Natural Phenomena Hazards for DOE Nuclear Facilities and Non-Nuclear Facilities”
3. DOE G 420.1-X, “Implementation Guide for Non-Reactor Nuclear Safety Design Criteria and Explosives”
4. DOE G 421.1-1 (Draft), “Criticality Safety Good Practices Program Guide for DOE Nonreactor Nuclear Facilities”
5. DOE G 440.1-3, “Occupational Exposure Assessment”

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6. ISMS Guide (DOE G 450.4-1), “Integrated Safety Management System Guide for Use with DOE P 450.4, Safety Management System, and DEAR Safety Management System Contract Clauses”
7. DOE G 460.2-1, “Departmental Materials Transportation and Packaging Management”
8. DOE G 830.330, Rev. 2, “Guidelines for the Selection, Training, Qualification, and Certification of Personnel at DOE Nuclear Facilities”

## H. DOE Standards

1. DOE-STD-1050-93, “Guideline to Good Practices for Planning, Scheduling, and Coordination of Maintenance at DOE Nuclear Facilities”
2. DOE-STD-1066-97, “Fire Protection Design Criteria” (Became DOE-STD-1066-99 after a 1999 Page Change. Definitions the same in both printings.)
3. DOE-STD-1073-93-Pt.1, “Guideline for Operational Configuration Management Program”
4. DOE-STD-1073-93-Pt.2, “Guideline for Operational Configuration Management Program”
5. DOE –STD-1120-98, Vol. 1, “Integration of Environment, Safety, and Health into Facility Disposition Activities”
6. DOE-STD-3003-94, “Backup Power Sources for DOE Facilities”
7. DOE-STD-3009-94, “Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports”

## I. Miscellaneous

1. Deferred Maint. Memo, Memorandum from Antonio Tavares, Director, DOE Office of Project and Fixed Asset Management, entitled “Deferred Maintenance Reporting Requirement Supplemental Guidance” dated July 7, 1998
2. DNFSB/TECH-16, “Integrated Safety Management”

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3. DOE Glossary, “Glossary of Terms” created May 16, 1996, by the former Corporate Management Practice Group, HR-62, under the Assistant Secretary for Human Resources and Administration”
4. EH62dd1, glossary of safety-related terms created in the Office of Nuclear Energy (NE), NE-70 during early 1990’s
5. DOE-TSPP-2, Rev. 3, “DOE Technical Standards Program Procedures Number 2 entitled, Establishing the Need for a Technical Standard”
6. UCRL-15910, “Design and Evaluation Guidelines for Department of Energy Facilities Subjected to Natural Phenomena Hazards”
7. ANSI/IEEE-446-1987, “IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications”



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# **APPENDIX**

## **Glossary of Terms Used in DOE NEPA Documents**

**September 1998**

**U.S. DEPARTMENT OF ENERGY  
ENVIRONMENT, SAFETY AND HEALTH  
OFFICE OF NEPA POLICY AND ASSISTANCE**

03/16/2001

## PREFACE

### INTRODUCTION

#### 1.1 Purpose of this Glossary

This Glossary is provided as a resource for preparing technical glossaries and related explanatory material (such as text-box explanations of technical concepts) for DOE National Environmental Policy Act (NEPA) documents. Technical terms used in DOE NEPA documents should be defined to aid lay readers' understanding. Definitions may be provided either in the body of the document (recommended for terms that have different meanings technically than colloquially, such as "canyon" and "pit") or in a glossary section.

Using this Glossary should foster efficiency and consistency in the preparation of DOE NEPA documents. DOE NEPA practitioners are not required to use these definitions, however, as discussed further below.

#### 1.2 Source for Definitions

Definitions in this Glossary were derived from the most authoritative sources available (e.g., a statute, regulation, DOE directive, dictionary, or technical reference book) and checked against other authorities. A key to the abbreviations used to designate the source is presented at the end of the Glossary.

Because the primary purpose of this Glossary is to enhance reader understanding of DOE NEPA documents, some authoritative definitions have been modified to make them clearer to lay readers. Such modifications include punctuation changes, rearranged clauses, added clarifying information, or deletions of material that seems unlikely to aid reader understanding. The Glossary identifies the source of each definition. The phrase "derived from" is added when the definition is based on the identified source or sources, but does not exactly follow the original. (In addition to the examples of modifications cited above, the definition may be condensed from a longer discussion in a technical reference.)

Finally, no source is given for terms such as "millirem," whose definition is universal, albeit not familiar to lay readers, and for definitions that were thoughtfully developed for this Glossary but do not originate from a generally recognized authority.

#### 1.3 How to Use this Glossary

Because of the diversity of DOE's missions and programs, a comprehensive glossary of terms used in DOE NEPA documents would include thousands of terms. This

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Glossary, however, defines only technical and regulatory terms that are commonly encountered in DOE NEPA documents.

This Glossary explains terms according to their most likely meanings in DOE NEPA documents. When more than one definition is provided, Glossary users should consider which definition best fits their circumstances. This listed sources for the definitions may help in determining which definition is best.

Document preparers should supplement definitions provided herein when necessary to meet the communication requirements for a particular NEPA document. Note that when a NEPA document uses a term in a different sense than is described in the Glossary (when “pit” refers to a hole in the ground, for example, rather than the fissile core of a nuclear weapon), the definition in this Glossary would be inappropriate. Glossary users may need to modify the definitions given herein to adequately describe how a term is used in a specific NEPA document. In other cases, the user’s need may be fully met by abbreviating a definition.

The Glossary will be available on the DOE NEPA Web at <http://tis.eh.doe.gov/nepa/>. The Office of NEPA policy and Assistance may revise or expand this guidance from time to time and welcomes suggestions for improvement.

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## Appendix

### Glossary of Terms Used in DOE NEPA Documents

1. ABSORBED DOSE. For ionizing radiation, the energy imparted to matter by ionizing radiation per unit mass of the irradiated material (e.g., biological tissue). The units of absorbed dose are the rad and the gray. (See rad and gray.) [Derived from DOE 5400.5, 10 CFR 20.1003]
2. ACCELERATOR. A device that accelerates charged particles (such as electrons, protons, and atomic nuclei) to high velocities, thus giving them high kinetic energies. (Kinetic energy is the energy associated with motion.)  
*Add, as appropriate:*  
The accelerated particles may be used in industrial and medical applications or in research on nuclear or subnuclear phenomena.  
  
[Derived from Fermilab, LBL]
3. ACCIDENT. An unplanned event or sequence of events that results in undesirable consequences. [Derived from DOE G 420.1-X, DOE-STD-3009-94]
4. ACTINIDE. Any member of the group of elements with atomic numbers from 89 (actinium) to 103 (lawrencium) including uranium and plutonium. All members of this group are radioactive. [Derived from ESTD]
5. ACUTE EXPOSURE. A single, short-term exposure to radiation, a toxic substance, or other stressors that may result in biological harm.  
  
Pertaining to radiation, the exposure incurred during and shortly after a radiological release. Acute exposure involves the absorption or intake of a relatively large amount of radiation or radioactive material. [Derived from Suter, HPRH]
6. AIR POLLUTANT. Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare. [Derived from EPA Terms]

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\*A key to the abbreviations used to designate sources is presented at the end of the glossary.

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7. AIR QUALITY. The cleanliness of the air as measured by the levels of pollutants relative to standards or guideline levels established to protect human health and welfare. Air quality is often expressed in terms of the pollutant for which concentrations are the highest percentage of a standard (e.g., air quality may be unacceptable if the level of one pollutant is 150% of its standard, even if levels of other pollutants are well below their respective standards). [Derived from EPA Terms]
8. ALARA. See “As low as reasonably achievable.”
9. ALPHA PARTICLE. A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It is identical to a helium nucleus and has a mass number of 4 and an electrostatic charge of +2. It has low penetrating power and a short range (a few centimeters in air). (See alpha radiation.) [NRC Glossary]
10. ALPHA RADIATION. A strongly ionizing, but weakly penetrating, form of radiation consisting of positively charged alpha particles emitted spontaneously from the nuclei of certain elements during radioactive decay. Alpha radiation is the least penetrating of the four common types of ionizing radiation (alpha, beta, gamma, and neutron). Even the most energetic alpha particle generally fails to penetrate the dead layers of cells covering the skin and can be easily stopped by a sheet of paper. Alpha radiation is most hazardous when an alpha-emitting source resides inside an organism. (See alpha particle.) [Derived from NRC Glossary, NCRP 65]
11. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS). Requirements that must be met when taking an action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). They include cleanup standards, standards of control, and other substantive environmental protection requirements and criteria established under Federal and state law and regulations. (See Comprehensive Environmental Response, Compensation, and Liability Act.) [Derived from 40 CFR 300.5]
12. AQUIFER. A body of rock or sediment that is capable of transmitting groundwater and yielding usable quantities of water to wells or springs. [Derived from AGI 87, DOE 6430.1A]

*EPA regulations define “aquifer” as follows (different regulations vary slightly in wording):*

An underground geological formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to wells or springs. [40 CFR 146.3, 149.2, 144.3, 191.12, 260.10, 270.2]

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13. AS LOW AS REASONABLY ACHIEVABLE (ALARA). An approach to radiation protection to manage and control worker and public exposures (both individual and collective) and releases of radioactive material to the environment to as far below applicable limits as social, technical, economic, practical, and public policy considerations permit. ALARA is not a dose limit but a process for minimizing doses to as far below limits as is practicable. [Derived from 10 CFR 835.2, Proposed 10 CFR 834]
14. ATTAINMENT AREA. An area that the Environmental Protection Agency has designated as being in compliance with one or more of the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. An area may be in attainment for some pollutants but not for others. (See National Ambient Air Quality Standards (NAAQS), nonattainment area, and particulate matter.) [Derived from EPA Terms]
15. AVERAGE (50%) METEOROLOGY. Meteorological conditions that, for a particular area, correspond to the median amount of mixing of pollutants with the less contaminated surrounding air. The term indicates conditions during which more favorable mixing conditions occur 50% of the time and less favorable mixing conditions occur 50% of the time. The term “average meteorology” is often used without further definition; it corresponds to a median value. [See conservative (95%) meteorology.] [Derived from DOE 6430.1A]
16. BACKGROUND RADIATION. Radiation from (1) cosmic sources, (2) naturally occurring radioactive materials, including radon (except as a decay product of source or special nuclear material), and (3) global fallout as it exists in the environment (e.g., from the testing of nuclear explosive devices). [Derived from 10 CFR 20.1003, NRC Glossary]
17. BASELINE. The existing environmental conditions against which impacts of the proposed action and its alternatives can be compared.

*For a specific NEPA document, a further statement can be included about the date or conditions that are considered the baseline. For example: “For this Environmental Impact Statement the environmental baseline is the environmental condition of the site as it exists in 1999.”*

18. BEST AVAILABLE CONTROL TECHNOLOGY (BACT). Available devices, systems, or techniques for achieving the maximum reduction of air-pollutant emissions while considering energy, environmental, and economic impacts. BACT is determined on a case-by-case basis for new sources or major modifications to existing sources in areas that are in attainment of National Ambient Air Quality Standards (NAAQS). BACT does not permit emissions in excess of those allowed under any Clean Air Act provisions. [See lowest achievable emissions rate (LAER), maximum achievable control technology

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(MACT), reasonably achievable control technology (RACT), and National Ambient Air Quality Standards (NAAQS).] [Derived from EPA Terms, 40 CFR 51.166(b)(12)]

19. BEST AVAILABLE TECHNOLOGY (BAT). *Under the Clean Water Act:*

Economically achievable pollution control methods that will allow point sources to comply with the effluent limitations required by the Clean Water Act. Factors to be taken into account in assessing what is the best available technology include the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as the Environmental Protection Agency Administrator deems appropriate. [Derived from CWA sects. 301(b) and 304(b)(2)(B)]

*Under the Safe Drinking Water Act:*

The best technology, treatment techniques, or other means that the Environmental Protection Agency Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available taking cost into consideration. For the purposes of setting maximum contaminant levels (MCLs) for synthetic organic chemicals, any BAT must be at least as effective as granular activated carbon. (See maximum contaminant level.) [40 CFR 141.2, EPA Glossary, WQA Glossary]

20. BEST DEMONSTRATED AVAILABLE TECHNOLOGY (BDAT). The most effective commercially available means of treating specific types of hazardous waste, as designated by the Environmental Protection Agency in 40 CFR Part 268. BDATs may change with advances in treatment technologies. [Derived from EPA Terms]
21. BEST MANAGEMENT PRACTICES (BMP). Structural, nonstructural, and managerial techniques, other than effluent limitations, to prevent or reduce pollution of surface water. They are the most effective and practical means to control pollutants that are compatible with the productive use of the resource to which they are applied. BMPs are used in both urban and agricultural areas. BMPs can include schedules of activities; prohibitions of practices; maintenance procedures; treatment requirements; operating procedures; and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. [Derived from EPA Glossary, 40 CFR 122.2, 40 CFR 232.2]
22. BETA RADIATION. Ionizing radiation consisting of fast moving, positively or negatively charged elementary particles emitted from atomic nuclei during radioactive decay. Beta radiation is more penetrating, but less ionizing than alpha radiation. Negatively charged beta particles are identical to electrons; positively charged beta

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particles are known as positrons. Both are stopped by clothing or a thin sheet of metal.  
[Derived from EPA RPD]

23. BOUND. To use simplifying assumptions and analytical methods in an analysis of impacts or risks such that the result overestimates or describes an upper limit on (i.e., Abounds@) potential impacts or risks.

*Related terms:*

A *bounding analysis* is an analysis designed to overestimate or determine an upper limit to potential impacts or risks.

A *bounding accident* is a hypothetical accident, the calculated consequences of which equal or exceed the consequences of all other potential accidents for a particular activity or facility.

24. BY-PRODUCT MATERIAL. Any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. [AEA]

*Where relevant to a particular NEPA document, add:*

By-product material is exempt from regulation under the Resource Conservation and Recovery Act. However, the exemption applies only to the actual radionuclides dispersed or suspended in the waste substance. Any nonradioactive hazardous waste component of the waste is subject to regulation under the Resource Conservation and Recovery Act.  
[Derived from DOE 5820.2A, 10 CFR 962]

25. CALCINE. To heat a solid to a high temperature below the melting point in order to drive off volatile constituents, convert the material to a powder, or cause other changes, such as oxidation or reduction. Originally referred specifically to the heating of calcium carbonate (i.e., limestone) to drive off carbon dioxide gas and form calcium oxide (i.e., quicklime).

*Note: Calcine may also be used as a noun, referring to the product of calcining.*

[Derived from AHD, MW, and UW]

26. CANDIDATE SPECIES. Plants and animals native to the United States for which the U.S. Fish and Wildlife Service or the National Marine Fisheries Service has sufficient information on biological vulnerability and threats to justify proposing to add them to the threatened and endangered species list, but cannot do so immediately because other species have a higher priority for listing. The Services determine the relative listing priority of candidate taxa in accordance with general listing priority guidelines published



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in the *Federal Register*. (See endangered species and threatened species.) [Derived from ESA WN, 62 FR 49398]

- 27. CANISTER. A general term for a container, usually cylindrical, used in handling, storage, transportation, or disposal of waste.
- 28. CANYON. A large heavily shielded concrete building containing a remotely operated plutonium or uranium processing facility.
- 29. CAPABLE FAULT. In general, “capable fault” means a geologic fault along which it is mechanically feasible for sudden slip (i.e., earth motion) to occur. [Derived from Bolt]

Nuclear Regulatory Commission reactor siting regulations define a capable fault as a fault which has exhibited one or more of the following characteristics:

(1) Movement at or near the ground surface at least once within the past 35,000 years or movement of a recurring nature within the past 500,000 years.

(2) Macro-seismicity instrumentally determined with records of sufficient precision to demonstrate a direct relationship with the fault.

(3) A structural relationship to a capable fault according to characteristics (1) or (2) such that movement on one could be reasonably expected to be accompanied by movement on the other.

[10 CFR 100, Appendix A]

- 30. CASK. A heavily shielded container used to store or ship radioactive materials. [NRC Glossary]
- 31. CHARACTERISTIC WASTE. Solid waste that is classified as hazardous waste because it exhibits any of the following properties or “characteristics”: ignitability, corrosivity, reactivity, or toxicity, as described in 40 CFR 261.20 through 40 CFR 261.24. (See hazardous waste, solid waste, and waste characterization.) [Derived from 40 CFR 261]
- 32. CHRONIC EXPOSURE. A continuous or intermittent exposure of an organism to a stressor (e.g., a toxic substance or ionizing radiation) over an extended period of time or significant fraction (often 10% or more) of the life span of the organism. Generally, chronic exposure is considered to produce only effects that can be observed some time following initial exposure. These may include impaired reproduction or growth, genetic effects, and other effects such as cancer, pre-cancerous lesions, benign tumors, cataracts, skin changes, and congenital defects. [Derived from Suter, EPA RPD]

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33. CLADDING. The outer metal jacket of a nuclear fuel element or target. It prevents fuel corrosion and retains fission products during reactor operation and subsequent storage, as well as providing structural support. Zirconium alloys, stainless steel, and aluminum are common cladding materials.

In general, a metal coating bonded onto another metal.

[Derived from NRC Glossary, TM]

34. CLASS I AREA. A specifically designated area where the degradation of air quality is stringently restricted (e.g., many national parks, wilderness areas). (See prevention of significant deterioration.) [Derived from 40 CFR 51.166(e)]
35. CLOSURE. Refers to the deactivation and stabilization of a waste treatment, storage, or disposal unit (such as a waste treatment tank, waste storage building, or landfill) or hazardous materials storage unit (such as an underground storage tank). For storage units, closure typically includes removal of all residues, contaminated system components, and contaminated soil. For disposal units (i.e., where waste is left in place), closure typically includes site stabilization and emplacement of caps or other barriers. Specific requirements for the closure process are found in the regulations applicable to many types of waste management units and hazardous material storage facilities.

*Provide a document-specific definition if appropriate.*

[Derived from DOE M 435.1; 40 CFR Parts 192, 258, 264, 265, 270, and 280; 10 CFR Parts 60 and 61]

36. COLLECTIVE DOSE. The sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation. Collective dose is expressed in units of person-rem or person-sievert. [Derived from 10 CFR 20.1003; 10 CFR 835.2]
37. COMMITTED DOSE EQUIVALENT. The dose equivalent to organs or tissues that will be received by an individual during the 50-year period following the intake of radioactive material. It does not include contributions from radiation sources external to the body. Committed dose equivalent is expressed in units of rems or sieverts.

*Note: The International Commission on Radiological Protection recognizes the term “committed equivalent dose” rather than “committed dose equivalent.”*

[Derived from 10 CFR 20.1003, 10 CFR 835.2]

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38. COMMITTED EFFECTIVE DOSE EQUIVALENT. The dose value obtained by (1) multiplying the committed dose equivalents for the organs or tissues that are irradiated and the weighting factors applicable to those organs or tissues and (2) summing all the resulting products. Committed effective dose equivalent is expressed in units of rem or sievert. (See committed dose equivalent and weighting factor.) [Derived from 10 CFR 20.1003, DOE 5400.5]
39. COMMITTED EQUIVALENT DOSE. The committed dose in a particular organ or tissue accumulated in a specified period (e.g., 50 years for workers and 70 years for members of the public) after intake of a radionuclide. [Derived from NCRP 116]
40. COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA). A Federal law (also known as Superfund), enacted in 1980 and reauthorized in 1986, that provides the legal authority for emergency response and cleanup of hazardous substances released into the environment and for the cleanup of inactive waste sites. [Derived from DOE G 430.1-1, CERCLA]
41. CONSERVATIVE (95%) METEOROLOGY. Meteorological conditions that, for a particular area, are relatively unfavorable for the mixing of air pollutants with surrounding, less polluted, air. The term indicates conditions under which more favorable mixing conditions occur 95% of the time, and less favorable mixing conditions occur only 5% of the time. [See Average (50%) meteorology.] [Derived from DOE 6430.1A]
42. CONTACT-HANDLED WASTE. Radioactive waste or waste packages whose external dose rate is low enough to permit contact handling by humans during normal waste management activities. [DOE glossary]

"Contact-handled transuranic waste" means transuranic waste with a surface dose rate not greater than 200 millirem per hour. [WIPP LWA]

(See remote-handled waste.)

43. CRITERIA POLLUTANT. An air pollutant that is regulated by National Ambient Air Quality Standards (NAAQS). The Environmental Protection Agency must describe the characteristics and potential health and welfare effects that form the basis for setting, or revising, the standard for each regulated pollutant. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and two size classes of particulate matter, less than 10 micrometers (0.0004 inch) in diameter, and less than 2.5 micrometers (0.0001 inch) in diameter. New pollutants may be added to, or removed from, the list of criteria pollutants as more information becomes available. (See National Ambient Air Quality Standards.)

*Note: Sometimes pollutants regulated by state laws are also called criteria pollutants.*

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[Derived from EPA Terms]

44. CRITICAL HABITAT. Habitat essential to the conservation of an endangered or threatened species that has been designated as critical by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act and its implementing regulations (50 *CFR* 424). (See endangered species and threatened species.)

The lists of Critical Habitats can be found in 50 *CFR* 17.95 (fish and wildlife), 50 *CFR* 17.96 (plants), and 50 *CFR* 226 (marine species).

[Derived from 50 *CFR* 402.02, 50 *CFR* 424.02(d)]

45. CRITICAL ORGAN. The body organ receiving a radionuclide or radiation dose that would result in the greatest overall damage to the body. Specifically, that organ in which the dose equivalent would be most significant due to a combination of the organ's radiological sensitivity and the dose distribution throughout the body. [Derived from HPRH, ANSI N1.1]
46. CRITICALITY. The condition in which a system is capable of sustaining a nuclear chain reaction. [Derived from DOE 6430.1A, DOE 5480.30, DOE Glossary]

*Chain reaction*: A reaction that initiates its own repetition. In nuclear fission, a chain reaction occurs when a neutron induces a nucleus to fission and the fissioning nucleus releases one or more neutrons which induce other nuclei to fission. [Derived from UI]

*Critical Mass*: The smallest mass of fissionable material that will support a self-sustaining nuclear chain reaction. [Derived from UI]

47. CUMULATIVE IMPACTS. Impacts on the environment that result when the incremental impact of a proposed action is added to the impacts from other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes the other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. [Derived from 40 *CFR* 1508.7]
48. CURIE (CI). A unit of radioactivity equal to 37 billion disintegrations per second (i.e., 37 billion becquerels); also a quantity of any radionuclide or mixture of radionuclides having 1 curie of radioactivity. [Derived from HPRH, NCRP 51, 10 *CFR* 20.1005]
49. DECAY, RADIOACTIVE. The decrease in the amount of any radioactive material with the passage of time, due to spontaneous nuclear disintegration (i.e., emission from atomic nuclei of charged particles, photons, or both). [Derived from RHH, HPRH, NRC Glossary]

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50. DECIBEL. A unit for expressing the relative intensity of sounds on a logarithmic scale from zero for the average least perceptible sound to about 130 for the average level at which sound causes pain to humans. For traffic and industrial noise measurements, the A-weighted decibel (dBA), a frequency-weighted noise unit, is widely used. The A-weighted decibel scale corresponds approximately to the frequency response of the human ear and thus correlates well with loudness. [Derived from EPA Glossary, ESTD]
51. DEPLETED URANIUM. Uranium whose content of the fissile isotope uranium-235 is less than the 0.7 percent (by weight) found in natural uranium, so that it contains more uranium-238 than natural uranium. (See uranium and natural uranium.)

*Where relevant to a particular NEPA document, add:*

Depleted uranium generally is derived from residues of uranium isotope separation; some is derived from spent nuclear fuel.

[Derived from 10 CFR 71, 49 CFR 173.403, NRC Glossary, MH]

52. DESIGN BASIS ACCIDENT. An accident postulated for the purpose of establishing functional and performance requirements for safety structures, systems, and components. [DOE G 420.1-X (see DOE-STD-3009-94)]
53. DETECTOR. A device used to convert the energy of incident radiation into another form (such as light, an electrical signal, or a trace in a chemical emulsion) in order to observe or measure radiation. [Derived from PD, ANSI N42.18]

*A particle detector is any device used to sense the passage of atomic or subatomic particles or to measure their properties. For many particle detectors, this involves observing and measuring the radiation (electromagnetic or ionizing) released as particles interact with a gaseous, liquid, or solid medium or an electromagnetic field. The term also may refer to a collection of particle detection devices designed so that each serves a particular purpose in allowing physicists to reconstruct particle events. [Derived from LBL, HEP]*

54. DOSE (CHEMICAL). The amount of a substance administered to, taken up by, or assimilated by an organism. It is often expressed in terms of the amount of substance per unit mass of the organism, tissue, or organ of concern. [Derived from HL]
55. DOSE (RADIOLOGICAL). A generic term meaning absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or committed equivalent dose, as defined elsewhere in this glossary. [Derived from 10 CFR 20.1003]

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56. DOSE COMMITMENT. The total dose equivalent a body, organ, or tissue would receive during a specified period of time (e.g., 50 years) as a result of intake (as by ingestion or inhalation) of one or more radionuclides from a defined release. [Derived from ANSI N343]
57. DOSE EQUIVALENT. A measure of radiological dose that correlates with biological effect on a common scale for all types of ionizing radiation. Defined as a quantity equal to the absorbed dose in tissue multiplied by a quality factor (the biological effectiveness of a given type of radiation) and all other necessary modifying factors at the location of interest. The units of dose equivalent are the rem and sievert (Sv). [Derived from 10 CFR 20.1003, FGR 11]
58. ECOLOGY. A branch of science dealing with the interrelationships of living organisms with one another and with their nonliving environment. [Derived from MW, ESTD]
59. ECOSYSTEM. A community of organisms and their physical environment interacting as an ecological unit. [EE&S]
60. EFFECTIVE DOSE EQUIVALENT. The dose value obtained by multiplying the dose equivalents received by specified tissues or organs of the body by the appropriate weighting factors applicable to the tissues or organs irradiated, and then summing all of the resulting products. It includes the dose from radiation sources internal and external to the body. The effective dose equivalent is expressed in units of rems or sieverts. (See committed dose equivalent and committed effective dose equivalent.) [Derived from 10 CFR 835.2, 10 CFR 20.1003, DOE 5400.5]
61. EFFLUENT. A waste stream flowing into the atmosphere, surface water, ground water, or soil. Most frequently the term applies to wastes discharged to surface waters. [Derived from EPA Terms]
62. ENDANGERED SPECIES. Plants or animals that are in danger of extinction through all or a significant portion of their ranges and that have been listed as endangered by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act and its implementing regulations (50 CFR 424). (See threatened species.)

The lists of endangered species can be found in 50 CFR 17.11 (wildlife), 50 CFR 17.12 (plants), and 50 CFR 222.23(a) (marine organisms).

*Note: Some states also list species as endangered. Thus, in certain cases a state definition would also be appropriate.*

[Derived from ESA sect. 3(6) [16 U.S.C. '1532(6)], 50 CFR 17.3, 50 CFR 424.02(e)]

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63. ENRICHED URANIUM. Uranium whose content of the fissile isotope uranium-235 is greater than the 0.7 percent (by weight) found in natural uranium. (See uranium and natural uranium.) [Derived from 10 CFR 71, 49 CFR 173.403]
64. ENVIRONMENTAL ASSESSMENT (EA). A concise public document that a Federal agency prepares under the National Environmental Policy Act (NEPA) to provide sufficient evidence and analysis to determine whether a proposed agency action would require preparation of an environmental impact statement (EIS) or a finding of no significant impact. A Federal agency may also prepare an EA to aid its compliance with NEPA when no EIS is necessary or to facilitate preparation of an EIS when one is necessary.  
An EA must include brief discussions of the need for the proposal, alternatives, environmental impacts of the proposed action and alternatives, and a list of agencies and persons consulted. (See finding of no significant impact, environmental impact statement, and National Environmental Policy Act.) [Derived from 40 CFR 1508.9, 10 CFR 1022.4(d)]
65. ENVIRONMENTAL IMPACT STATEMENT (EIS). The detailed written statement that is required by section 102(2)(C) of the National Environmental Policy Act (NEPA) for a proposed major Federal action significantly affecting the quality of the human environment. A DOE EIS is prepared in accordance with applicable requirements of the Council on Environmental Quality NEPA regulations in 40 CFR Parts 1500-1508, and the Department of Energy NEPA regulations in 10 CFR Part 1021.  
The statement includes, among other information, discussions of the environmental impacts of the proposed action and all reasonable alternatives, adverse environmental effects that can not be avoided should the proposal be implemented, the relationship between short-term uses of the human environment and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources. [Derived from 40 CFR 1500-1508]
66. ENVIRONMENTAL JUSTICE. The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies.

Executive Order 12898 directs federal agencies to make achieving environmental justice part of their missions by identifying and addressing disproportionately high and adverse effects of agency programs, policies, and activities on minority and low-income populations. (See minority population and low-income population.) [Derived from EPA EJ and E.O. 12898]

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67. EPICENTER. The point on the earth's surface directly above the focus of an earthquake. [AGI 76]
68. EPIDEMIOLOGY. Study of the occurrence, causes, and distribution of disease or other health-related states and events in human populations, often as related to age, sex, occupation, ethnic, and economic status, in order to identify and alleviate health problems and promote better health. [Derived from EPA Glossary, ATSDR GL]
69. EXPOSURE. The condition of being subject to the effects of or acquiring a dose of a potential stressor such as a hazardous chemical agent or ionizing radiation; also, the process by which an organism acquires a dose of a chemical such as mercury or a physical agent such as ionizing radiation. Exposure can be quantified as the amount of the agent available at various boundaries of the organism (e.g., skin, lungs, gut) and available for absorption.

In the radiological context “exposure” refers to the state of being irradiated by ionizing radiation or the incidence of radiation on living or inanimate material. More specifically, radiation exposure is a dosimetric quantity for ionizing radiation, based on the ability of radiation to produce ionization in air. It is the time integral of the radiation intensity incident at a given position. Exposure is expressed in units of roentgens (R) or coulombs per kilogram (C/kg).

*Note: Although still encountered occasionally as a unit of exposure, the roentgen is no longer in favor; the coulomb per kilogram is the SI unit of exposure and is now generally accepted.*

[Derived from MW, 10 CFR 20.1003, Suter, ANSI N1.1, ANSI N13.6, NBS 55, ICRP]

70. EXPOSURE PATHWAY. The course a chemical or physical agent takes from the source to the exposed organism. An exposure pathway describes a mechanism by which chemicals or physical agents at or originating from a release site reach an individual or population. Each exposure pathway includes a source or release from a source, an exposure route, and an exposure point. If the exposure point differs from the source, a transport/exposure medium such as air or water is also included. [Derived from EPA Terms]
71. FINDING OF NO SIGNIFICANT IMPACT (FONSI). A public document issued by a Federal agency briefly presenting the reasons why an action for which the agency has prepared an environmental assessment has no potential to have a significant effect on the human environment and, thus, will not require preparation of an environmental impact statement. (See environmental assessment and environmental impact statement.) [Derived from 10 CFR 1022.4(g)]



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72. FISSILE MATERIAL. General definition:

Although sometimes used as a synonym for fissionable material, this term has acquired a more restricted meaning; namely, any material fissionable by low-energy (i.e., thermal or slow) neutrons. Fissile materials include U-235, U-233, Pu-239, and Pu-241. (See fissionable material.) [Derived from NRC Glossary]

*Definition specific to hazardous materials transportation*

Means plutonium-238, plutonium-239, plutonium-241, uranium-233, uranium-235, or any combination of these radionuclides. The definition does not apply to unirradiated natural uranium and depleted uranium, and natural uranium or depleted uranium that has been irradiated in a thermal reactor. Certain additional exceptions are provided in 49 CFR 173.453. [49 CFR 173.403]

73. FISSION. A nuclear transformation that is typically characterized by the splitting of a heavy nucleus into at least two other nuclei, the emission of one or more neutrons, and the release of a relatively large amount of energy. Fission of heavy nuclei can occur spontaneously or be induced by neutron bombardment. [Derived from RHH, BEIR III]

74. FISSION PRODUCTS. Nuclei (fission fragments) formed by the fission of heavy elements, plus the nuclides formed by the fission fragments' radioactive decay. [NRC Glossary, HPRH, ANSI N1.1]

75. FISSIONABLE MATERIAL. Commonly used as a synonym for fissile material, the meaning of this term has been extended to include material that can be fissioned by fast neutrons, such as uranium-238. [NRC Glossary]

76. FLOODPLAINS. The lowlands and relatively flat areas adjoining inland and coastal waters and the flood prone areas of offshore islands. Floodplains include, at a minimum, that area with at least a 1.0 percent chance of being inundated by a flood in any given year.

The *base floodplain* is defined as the area which has a 1.0 percent or greater chance of being flooded in any given year. Such a flood is known as a 100-year flood.

The *critical action floodplain* is defined as the area which has at least a 0.2 percent chance of being flooded in any given year. Such a flood is known as a 500-year flood. Any activity for which even a slight chance of flooding would be too great (e.g., the storage of highly volatile, toxic, or water reactive materials) should not occur in the critical action floodplain.

The *probable maximum flood* is the hypothetical flood that is considered to be the most severe reasonably possible flood, based on the comprehensive hydrometeorological application of maximum precipitation and other hydrological factors favorable for

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maximum flood runoff (e.g., sequential storms and snowmelts). It is usually several times larger than the maximum recorded flood. [Derived from 10 CFR 1022.4, DOE Glossary]

77. FUGITIVE EMISSIONS. 1. Emissions that do not pass through a stack, vent, chimney, or similar opening where they could be captured by a control device. [Derived from EPA Terms]
2. Any air pollutant emitted to the atmosphere other than from a stack. Sources of fugitive emissions include pumps; valves; flanges; seals; area sources such as ponds, lagoons, landfills, piles of stored material (e.g., coal); and road construction areas or other areas where earthwork is occurring. [Derived from 40 CFR 57.103(m)]
78. FUSION. The combining of two light nuclei (such as hydrogen isotopes or lithium) to form a heavier nucleus. Fusion is accompanied by the release of large amounts of energy. [Derived from MH]
79. GAMMA RADIATION. High-energy, short wavelength, electromagnetic radiation emitted from the nucleus of an atom during radioactive decay. Gamma radiation frequently accompanies alpha and beta emissions and always accompanies fission. Gamma rays are very penetrating and are best stopped or shielded by dense materials, such as lead or depleted uranium. Gamma rays are similar to, but are usually more energetic than, x-rays. (See also alpha radiation, beta radiation, and fission). [Derived from NRC Glossary, HPRH]
80. GENETIC EFFECT. Inheritable changes (chiefly mutations) produced by exposure, to ionizing radiation or other chemical or physical agents, of the parts of cells that control biological reproduction and inheritance. [Derived from NCRP 48, RHH]
81. GRAY. The SI (International System of Units) unit of absorbed dose. One gray (Gy) is equal to an absorbed dose of 1 joule / kg (1 Gy = 100 rads. (The joule is the SI unit of energy, abbreviated as J.) (See absorbed dose.) [Derived from 10 CFR 20.1004]
82. GREATER-THAN-CLASS-C (GTCC) WASTE. Low-level radioactive waste from commercial sources containing radionuclide concentrations that exceed Nuclear Regulatory Commission limits for Class C low-level waste as defined in 10 CFR 61. It is the most radioactive of the categories of low-level radioactive waste. [Derived from DOE Glossary, 10 CFR 61]
83. GROUNDWATER. Water below the ground surface in a zone of saturation. [40 CFR 192.01]

*Related definition:*

Subsurface water is all water that exists in the interstices of soil, rocks, and sediment below the land surface, including soil moisture, capillary fringe water, and groundwater.

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That part of subsurface water in interstices completely saturated with water is called groundwater. [Derived from Walton, AZ WRRC]

84. HALF-LIFE (RADIOLOGICAL). The time in which one half of the atoms of a particular radionuclide disintegrate into another nuclear form. Half-lives for specific radionuclides vary from millionths of a second to billions of years. [Derived from NRC Glossary]
85. HAZARD ANALYSIS. The assessment of hazardous situations potentially associated with a process or activity. It includes the identification of material, system, process, and plant characteristics that can produce undesirable consequences. A safety analysis report hazard analysis examines the complete spectrum of potential accidents that could expose members of the public, onsite workers, facility workers, and the environment to hazardous materials. (See safety analysis report.) [Derived from DOE-STD-3009-94, DOE G 420.1-X]
86. HAZARDOUS AIR POLLUTANTS (HAPS). Air pollutants not covered by ambient air quality standards but which may present a threat of adverse human health effects or adverse environmental effects. Those specifically listed in 40 CFR 61.01 are asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. More broadly, HAPs are any of the 189 pollutants listed in or pursuant to section 112(b) of the Clean Air Act. Very generally, HAPs are any air pollutants that may realistically be expected to pose a threat to human health or welfare. [Derived from EPA Terms, 40 CFR 61.01, 40 CFR 63.2]
87. HAZARDOUS WASTE. A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20 through 40 CFR 261.24 (i.e., ignitability, corrosivity, reactivity, or toxicity) or be specifically listed by the Environmental Protection Agency in 40 CFR 261.31 through 40 CFR 261.33.
- Source, special nuclear, or by-product materials as defined by the Atomic Energy Act are not hazardous waste because they are not solid waste under RCRA.  
(See characteristic waste, Resource Conservation and Recovery Act, solid waste, and waste characterization.)
- [Derived from 40 CFR 261]
88. HEAVY-HAUL TRUCK. A truck that exceeds normally applicable vehicle weight limits for highway travel. State authorities may issue special permits allowing trucks to exceed weight limits in order to carry “nondivisible loads”, such as spent nuclear fuel casks, on public highways. Roadways and bridges may need to be upgraded in order to carry such vehicles. (See legal-weight truck.)

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*It may be appropriate to append information specific to the particular document, such as:*

As used in this environmental impact statement, heavy-haul truck means a truck with a gross vehicle weight (i.e., both the truck and cargo weight) of more than 129,000 pounds (58,500 kilograms). *Note: This specific terminology does not appear in the applicable Federal regulations.*

[Derived from 23 CFR 658]

89. HEAVY METALS. Metallic and semimetallic elements that are generally highly toxic to plants and animals and that tend to accumulate in food chains are referred to collectively as “heavy metals.” Heavy metals include lead, mercury, cadmium, chromium, and arsenic.

*Additional optional information:*

Many metallic and semimetallic elements analyzed in environmental samples are often referred to collectively as “heavy metals.”

*(For example, EPA regulation 40 CFR 258.4 refers to the following monitoring parameters as “heavy metals”: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, selenium, silver, thallium, vanadium, and zinc.)*

*Note: The term “heavy metals” is deeply embedded in environmental usage and will doubtless continue to be used. However, some of the elements commonly called “heavy metals” are not heavy (e.g., beryllium) or are not true metals (e.g., arsenic). Therefore, “heavy metals” should be avoided whenever more precise wording can be substituted.*

[Derived from ESTD, 40 CFR 258.4]

90. HEAVY METAL. In the context of nuclear technology, “heavy metal” means all uranium, plutonium, or thorium placed into a nuclear reactor. (See metric tons of heavy metal.)

[Derived from 40 CFR 191.12]

91. HEPA (HIGH EFFICIENCY PARTICULATE AIR) FILTER. An air filter capable of removing at least 99.97 percent of particles 0.3 micrometers (about 0.00001 inch) in diameter. These filters include a pleated fibrous medium (typically fiberglass) capable of capturing very small particles. [Derived from 40 CFR 61.152, 40 CFR 63.542, 40 CFR 763.83]

92. HIGH-LEVEL WASTE OR HIGH-LEVEL RADIOACTIVE WASTE (HLW). Defined by statute (the Nuclear Waste Policy Act) to mean the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products nuclides in sufficient concentrations; and other highly radioactive material

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that the U.S. Nuclear Regulatory Commission (NRC), consistent with existing law, determines by rule requires permanent isolation. The NRC has not defined “sufficient concentrations” of fission products or identified “other highly radioactive material that requires permanent isolation.” The NRC defines high-level radioactive waste (HLW) to mean irradiated (spent) reactor fuel, as well as liquid waste resulting from the operation of the first cycle solvent extraction system, the concentrated wastes from subsequent extraction cycles in a facility for reprocessing irradiated reactor fuel, and solids into which such liquid wastes have been converted.

*For a specific NEPA document, an additional statement can be included. For example: In this EIS “high-level waste” refers to [INSERT BRIEF EXPLANATION].*

*Note: DOE usage generally follows the NWPA definition. Thus, “high-level radioactive waste” does not include spent nuclear fuel, but refers to liquid wastes from reprocessing of spent nuclear fuel and targets and the solid (vitrified) waste forms into which such liquid wastes are converted. It is desirable to provide the NRC definition, too, because it is used in NRC regulations that apply to geologic waste repositories and other facilities for management of commercial spent nuclear fuel and high-level waste. In some DOE NEPA documents this term refers only to liquid high-level waste or only to vitrified high-level waste.*

[Derived from NWPA, NRC at 53 FR 17709 and 52 FR 5992, 10 CFR 60, NRC Glossary]

93. HIGHLY ENRICHED URANIUM (HEU). Uranium whose content of the fissile isotope uranium-235 has been increased through enrichment to 20 percent or more (by weight). (See natural uranium.)

*Additional information may be needed in some EISs:*

Highly enriched uranium can be used in making nuclear weapons and also as fuel for some isotope-production, research, naval propulsion, and power reactors.

[Derived from 10 CFR 50.2]

94. INCINERATION. Controlled burning of solid or liquid wastes to oxidize the combustible constituents and, especially for liquid wastes, to vaporize water, so as to reduce waste volume. [Derived from EPA Terms]

95. INTENSITY (OF AN EARTHQUAKE). A measure of the effects (due to ground shaking) of an earthquake at a particular location, based on observed damage to structures built by humans, changes in the earth’s surface, and reports of how people felt the earthquake. Earthquake intensity is measured in numerical units on the Modified Mercalli scale. [See Modified Mercalli Intensity scale and magnitude (of an earthquake).] [Derived from Bolt; 10 CFR 100, App. A]

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96. INTERIM STATUS FACILITY (UNDER RCRA). A hazardous waste management facility (i.e., treatment, storage, or disposal facility) subject to the permit requirements of the Resource Conservation and Recovery Act that was in existence on the effective date of the law or its implementing regulations. These facilities are considered to have been issued a permit on an interim basis if they have met requirements for notification and have submitted a permit application. Such facilities are required to meet the interim status standards described in 40 CFR Part 265 until they have been issued a final permit or until their interim status is withdrawn. [Derived from RCRA sect. 3005(e), 40 CFR 270 Subpart G]
97. INTERTIE. A transmission line that links two or more regional electric power systems. [CCTC]
98. INVOLVED WORKER. Worker who would participate in a proposed action. (See noninvolved worker.) [Derived from Recommendations Book]
99. IRRADIATED. Exposed to ionizing radiation. [Derived from NRC Glossary, ANSI N1.1]

The condition of reactor fuel elements and other materials in which atoms bombarded with nuclear particles have undergone nuclear changes. [Derived from UI, MHE]

100. ISOTOPE. Any of two or more variations of an element in which the nuclei have the same number of protons (i.e., the same atomic number) but different numbers of neutrons so that their atomic masses differ. Isotopes of a single element possess almost identical chemical properties, but often different physical properties (e.g., carbon-12 and -13 are stable, carbon-14 is radioactive). [Derived from HPRH, EPA Terms, RHD]
101. LATENT CANCER FATALITIES (LCF). Deaths from cancer resulting from, and occurring some time after, exposure to ionizing radiation or other carcinogens.
102. LEGAL-WEIGHT TRUCK. A truck that meets vehicle weight limits for U.S. Interstate Highways. Under Federal regulations (23 CFR 658.17) the total loaded weight of a tractor-trailer combination is limited to 80,000 pounds (34,874 kilograms). Some states allow heavier vehicles on highways within the state.

*Note: This specific terminology does not appear in the applicable Federal regulations.*

[Derived from 23 CFR 658]

103. LIFE CYCLE COSTS. 1. All the anticipated costs associated with a project or program alternative throughout its life. This includes costs from pre-operations through operations or to the end of the alternative. [DOE G 430.1-1]

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2. All costs, except the cost of personnel occupying the facility, incurred from the time that a space requirement is defined until that facility passes out of the government's hands. [DOE 6430.1A]

104. LOW-ENRICHED URANIUM (LEU). Uranium whose content of the fissile isotope uranium-235 has been increased through enrichment to more than 0.7 percent but less than 20 percent by weight. Most nuclear power reactor fuel contains low-enriched uranium containing 3 to 5 percent uranium-235. [Derived from 10 CFR 50.2 ]
105. LOWEST ACHIEVABLE EMISSION RATE (LAER). The emissions rate permitted for new sources or major modifications of existing sources in areas that are not in attainment of National Ambient Air Quality Standards (NAAQS). The LAER is defined on a case-by-case basis, according to the regulations found in 40 CFR 51.165. [Derived from 40 CFR 51.165]
106. LOW-INCOME POPULATION. Low-income populations, defined in terms of Bureau of the Census annual statistical poverty levels (Current Population Reports, Series P-60 on Income and Poverty), may consist of groups or individuals who live in geographic proximity to one another or who are geographically dispersed or transient (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect. (See environmental justice and minority population.) [Derived from CEQ EJ]
107. LOW-LEVEL RADIOACTIVE WASTE OR LOW-LEVEL WASTE (LLW). Radioactive waste that is not high-level waste, transuranic waste, spent nuclear fuel, or by-product tailings from processing of uranium or thorium ore. (See radioactive waste.)

*Optional addition:*

Low-level radioactive waste is generated in many physical and chemical forms and levels of contamination.

*Note: If the document uses this term to mean only low-level waste that is subject to the AEA, it may be appropriate to add "accelerator-produced waste" and "naturally occurring radioactive material" to the list of exclusions.*

[Derived from NWPA, DOE O 435.1, NRC glossary]

108. MAGNITUDE (OF AN EARTHQUAKE). A quantity characteristic of the total energy released by an earthquake, as contrasted to "intensity," which describes its effects at a particular place. Magnitude is determined by taking the common logarithm (base 10) of the largest ground motion recorded on a seismograph during the arrival of a seismic wave type and applying a standard correction factor for distance to the epicenter. Three common types of magnitude are Richter (or local) ( $M_L$ ), P body wave ( $m_b$ ), and surface wave ( $M_s$ ).

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Additional magnitude scales, notably the moment magnitude ( $M_w$ ), have been introduced to increase uniformity in representation of earthquake size. *Moment magnitude* is defined as the rigidity of the rock multiplied by the area of faulting multiplied by the amount of slip.

A one-unit increase in magnitude (for example, from magnitude 6 to magnitude 7) represents a 30-fold increase in the amount of energy released.

[See intensity (of an earthquake).]

[Derived from AGI 76, Bolt]

109. MAXIMALLY EXPOSED INDIVIDUAL (MEI). A hypothetical individual whose location and habits result in the highest total radiological or chemical exposure (and thus dose) from a particular source for all exposure routes (e.g., inhalation, ingestion, direct exposure). [Derived from NCRP 93]
110. MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY (MACT). Technology for achieving the maximum control of emissions from major sources of hazardous air pollutants, using particularly stringent control devices, as prescribed in 40 CFR 63.41 for new sources and in 40 CFR 63.51 for existing sources. [Derived from 40 CFR 63.41, 40 CFR 63.51]
111. MAXIMUM CONTAMINANT LEVEL (MCL). The designation for U.S. Environmental Protection Agency standards for drinking water quality under the Safe Drinking Water Act. The maximum contaminant level for a given substance is the maximum permissible concentration of that substance in water delivered by a public water system. The primary MCLs (40 CFR Part 141) are intended to protect public health and are federally enforceable. They are based on health factors, but are also required by law to reflect the technological and economic feasibility of removing the contaminant from the water supply. Secondary MCLs (40 CFR Part 143) are set by the U.S. Environmental Protection Agency to protect the public welfare. The secondary drinking water regulations control substances in drinking water that primarily affect aesthetic qualities (such as taste, odor, and color) relating to the public acceptance of water. These regulations are not federally enforceable, but are intended as guidelines for the states. [Derived from 40 CFR 141.2, 40 CFR 143.1, 40 CFR 143.2, EPA OPPT]

*Related term:*

Maximum contaminant level goal (MCLG) means the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. Maximum contaminant level goals are non-enforceable health goals. [40 CFR 141.2]



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112. METRIC TONS OF HEAVY METAL (MTHM). Quantities of unirradiated and spent nuclear fuel and targets are traditionally expressed in terms of the initial weight in metric tons of uranium, plutonium, and thorium (collectively called “heavy metal”) in the unirradiated fuel. Other fuel components, such as cladding, alloy materials, and structural materials, are not included. A metric ton is 1,000 kilograms, which is equal to about 2,200 pounds. [Derived from 40 CFR 191.12, OCRWM MP]
113. MILLIREM (MREM). One-thousandth of a rem (0.001 rem). (See rem.)
114. MINORITY POPULATION. Minority populations exist where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than in the general population or other appropriate unit of geographic analysis (such as a governing body's jurisdiction, a neighborhood, census tract, or other similar unit). “Minority” refers to individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. “Minority populations” include either a single minority group or the total of all minority persons in the affected area. They may consist of groups of individuals living in geographic proximity to one another or a geographically dispersed/transient set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect. (See environmental justice and low-income population.) [Derived from CEQ EJ ]
115. MITIGATION. Mitigation includes:
- (1) avoiding an impact altogether by not taking a certain action or parts of an action;
  - (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation;
  - (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment;
  - (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of an action; or
  - (5) compensating for an impact by replacing or providing substitute resources or environments.
- [40 CFR 1508.20]
116. MIXED-OXIDE (MOX) FUEL. Reactor fuel made with a physical blend of different fissionable materials, such as uranium dioxide (UO<sub>2</sub>) and plutonium dioxide (PuO<sub>2</sub>).
117. MIXED WASTE. Waste that contains both hazardous waste, as defined under the Resource Conservation and Recovery Act, and source, special nuclear, or by-product material subject to the Atomic Energy Act.[Derived from FFCA]

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118. MODIFIED MERCALLI INTENSITY SCALE. The Modified Mercalli Intensity Scale is a standard of relative measurement of earthquake intensity, developed to fit construction conditions in most of the United States. It is a 12-step scale, with values from I (not felt except by a very few people) to XII (damage total). A Modified Mercalli Intensity is a numerical value on the Modified Mercalli Scale. [See intensity (of an earthquake).]

*Note: If this definition is listed, “intensity (of an earthquake)” must also be defined.*

[Derived from AGI 76; Bolt; 10 CFR 100, App A.]

119. NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS). Standards defining the highest allowable levels of certain pollutants in the ambient air (i.e., the outdoor air to which the public has access). Because the Environmental Protection Agency must establish the criteria for setting these standards, the regulated pollutants are called *criteria* pollutants. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and two size classes of particulate matter, less than 10 micrometers (0.0004 inch) in diameter, and less than 2.5 micrometers (0.0001 inch) in diameter. Primary standards are established to protect public health; secondary standards are established to protect public welfare (e.g., visibility, crops, animals, buildings). (See criteria pollutant.) [Derived from EPA Terms, 40 CFR 50]

120. NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS). Emissions standards set by the Environmental Protection Agency for air pollutants which are not covered by National Ambient Air Quality Standards (NAAQS) and which may, at sufficiently high levels, cause increased fatalities, irreversible health effects, or incapacitating illness. These standards are given in 40 CFR Parts 61 and 63. NESHAPS are given for many specific categories of sources (e.g., equipment leaks, industrial process cooling towers, dry cleaning facilities, petroleum refineries). (See hazardous air pollutants.) [Derived from EPA Terms, 40 CFR 61, 40 CFR 63]

121. NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA). NEPA is the basic national charter for protection of the environment. It establishes policy, sets goals (in Section 101), and provides means (in Section 102) for carrying out the policy. Section 102(2) contains “action-forcing” provisions to ensure that Federal agencies follow the letter and spirit of the Act. For major Federal actions significantly affecting the quality of the human environment, Section 102(2)(C) of NEPA requires Federal agencies to prepare a detailed statement that includes the environmental impacts of the proposed action and other specified information. [Derived from 40 CFR 1500.1(a)]

122. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES). A provision of the Clean Water Act which prohibits discharge of pollutants into waters of the United States unless a special permit is issued by the Environmental Protection Agency, a state, or, where delegated, a tribal government on an Indian reservation. The NPDES permit

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lists either permissible discharges, the level of cleanup technology required for wastewater, or both. [Derived from EPA Glossary]

123. NATIONAL PRIORITIES LIST (NPL). The Environmental Protection Agency's (EPA's) list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The list is based primarily on the score a site receives from the Hazard Ranking System described in 40 CFR Part 300, Appendix A. EPA must update the NPL at least once a year. (See Comprehensive Environmental Response, Compensation, and Liability Act.) [Derived from EPA Terms]
124. NATIONAL REGISTER OF HISTORIC PLACES. The official list of the Nation's cultural resources that are worthy of preservation. The National Park Service maintains the list under direction of the Secretary of the Interior. Buildings, structures, objects, sites, and districts are included in the National Register for their importance in American history, architecture, archeology, culture, or engineering. Properties included on the National Register range from large-scale, monumentally proportioned buildings to smaller scale, regionally distinctive buildings. The listed properties are not just of nationwide importance; most are significant primarily at the state or local level. Procedures for listing properties on the National Register are found in 36 CFR 60. [Derived from 106 SBS, 106 RV, NRHP]
125. NATURAL URANIUM. Uranium with the naturally occurring distribution of uranium isotopes (approximately 0.7 weight percent uranium-235, and the remainder essentially uranium-238). (See uranium, depleted uranium, enriched uranium, highly enriched uranium, and low-enriched uranium.) [10 CFR 71, 49 CFR 173.403]
126. NEUTRON RADIATION. The emission of neutrons from atomic nuclei. Neutrons are uncharged subatomic particles of nearly the same mass as protons. Interaction with atomic nuclei in matter results indirectly in ionization and thus an absorbed dose to biological material. Neutron bombardment of heavy nuclei (e.g., uranium, plutonium) can result in fission. Highly penetrating, neutrons can be stopped by thick masses of concrete, water or paraffin. [Derived from IAEA]
127. NONATTAINMENT AREA. An area that the U.S. Environmental Protection Agency has designated as not meeting (i.e., not being in attainment of) one or more of the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. An area may be in attainment for some pollutants, but not for others. [See attainment area, National Ambient Air Quality Standards (NAAQS), and particulate matter.] [Derived from EPA Terms]
128. NONINVOLVED WORKER. A worker who would be on the site of an action but would not participate in the action. (See involved worker.) [Recommendations Book]

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129. NUCLEAR FACILITY. A facility that is subject to requirements intended to control potential nuclear hazards. Defined in DOE directives as any nuclear reactor or any other facility whose operations involve radioactive materials in such form and quantity that a significant nuclear hazard potentially exists to the employees or the general public. [Derived from DOE 6430.1A, DOE 5480.30]
130. OVERPACK. In general, any container into which another container (usually a waste container) is placed. An overpack might be used to provide shielding and structural support (for example, during transportation), to provide additional physical containment for the contents of the inner container, or to enclose a damaged container.

*Provide a document-specific definition if appropriate.*

131. PARTICULATE MATTER (PM), PM<sub>10</sub>, PM<sub>2.5</sub>. Any finely divided solid or liquid material, other than uncombined (i.e., pure) water. A subscript denotes the upper limit of the diameter of particles included. Thus, PM<sub>10</sub> includes only those particles equal to or less than 10 micrometers (0.0004 inch) in diameter; PM<sub>2.5</sub> includes only those particles equal to or less than 2.5 micrometers (0.0001 inch) in diameter.

*Note: The applicable regulations express the diameter as the aerodynamic diameter. This is not the true diameter, but is the diameter of a spherical particle of unit density (i.e., 1 gram/cubic centimeter) which behaves the same way as the particle under consideration. Thus, for example, a spherical particle 10 micrometers in diameter with greater than unit density would not be included as PM-10 because it would fall at the same rate as a particle with unit density and diameter greater than 10 micrometers.*

[Derived from EPA Terms, 40 CFR 50, 40 CFR 61.171]

132. PERFORMANCE ASSESSMENT. *In general:*  
An analysis that predicts the behavior of a system or system component under a given set of conditions. [Derived from 10 CFR 960.2]

*In the context of DOE waste management activities:*

A systematic analysis of the potential risks posed by waste management systems to the public and environment, and a comparison of those risks to established performance objectives. [Derived from DOE 5820.2A]

*As defined in EPA regulation 40 CFR 191.12:*

An analysis that: (1) identifies the processes and events that might affect the disposal system; (2) examines the effects of these processes and events on the performance of the disposal system; and (3) estimates the cumulative releases of radionuclides, considering the associated uncertainties, caused by all significant processes and events. [Derived from 40 CFR 191.12]

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133. PERSON-REM. A unit of collective radiation dose applied to populations or groups of individuals (see collective dose); that is, a unit for expressing the dose when summed across all persons in a specified population or group. One person-rem equals 0.01 person-sieverts (Sv). [Derived from BEIR III 10 CFR 835.2]
134. PH. A measure of the relative acidity or alkalinity of a solution, expressed on scale from 0 to 14, with the neutral point at 7.0. Acid solutions have pH values lower than 7.0, and basic (i.e., alkaline) solutions have pH values higher than 7.0.

*Where further discussion would be helpful, add:*

Because pH is the negative logarithm of the hydrogen ion ( $H^+$ ) concentration, each unit increase in pH value expresses a change of state of 10 times the preceding state. Thus, pH 5 is 10 times more acidic than pH 6, and pH 9 is 10 times more alkaline than pH 8.

[Derived from ESTD, EE&S]

135. PICOCURIE. One trillionth ( $10^{-12}$ ) of a curie. (See curie.)
136. PIT. The core element of a nuclear weapon's "primary" or fission component. The pit contains a potentially critical mass of fissile material, such as plutonium-239 or highly enriched uranium, arranged in a subcritical geometry and surrounded by some type of casing. [Derived from DOE O 452.1A, DOE O 452.2A,]
137. PLUME. The elongated volume of contaminated water or air originating at a pollutant source such as an outlet pipe or a smokestack. A plume eventually diffuses into a larger volume of less contaminated material as it is transported away from the source. [Derived from EPA Terms]
138. PLUTONIUM. A heavy, radioactive, metallic element with the atomic number 94. It is produced artificially by neutron bombardment of uranium. Plutonium has 15 isotopes with atomic masses ranging from 232 to 246 and half-lives from 20 minutes to 76 million years. Its most important isotope is fissile plutonium-239. [Derived from NRC Glossary, AHD]
139. POLLUTION PREVENTION. The use of materials, processes, and practices that reduce or eliminate the generation and release of pollutants, contaminants, hazardous substances, and waste into land, water, and air. For the Department of Energy, this includes recycling activities. (See waste minimization.) [DOE P4]
140. POLYCHLORINATED BIPHENYLS (PCBS). Any compound or a mixture of compounds of a family of chlorinated organic chemicals that were formerly manufactured for use as coolants and lubricants in transformers, capacitors, and other electrical equipment.

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The manufacture of PCBs stopped in the United States in 1977 because of evidence that they build up in the environment and cause harmful effects. PCBs in water, for example, build up in fish and marine mammals and can reach levels thousands of times higher than the levels in water. It is not known whether PCBs cause cancer in people, but the Department of Health and Human Services has determined that PCBs may reasonably be anticipated to be carcinogens. The Environmental Protection Agency has classified all PCBs as Group B2, possible human carcinogens.[Derived from ATSDR, EPA IRIS]

141. PREVENTION OF SIGNIFICANT DETERIORATION (OF AIR QUALITY) (PSD).

Regulations established to prevent significant deterioration of air quality in areas that already meet National Ambient Air Quality Standards (NAAQS). Specific details of PSD are found in 40 CFR 51.166. Among other provisions, cumulative increases in sulfur dioxide, nitrogen dioxide, and PM-10 levels after specified baseline dates must not exceed specified maximum allowable amounts. These allowable increases, also known as increments, are especially stringent in areas designated as Class I areas (e.g., national parks, wilderness areas) where the preservation of clean air is particularly important. All areas not designated as Class I are currently designated as Class II. Maximum increments in pollutant levels are also given in 40 CFR 51.166 for Class III areas, if any such areas should be so designated by EPA. Class III increments are less stringent than those for Class I or Class II areas. [See National Ambient Air Quality Standards (NAAQS).] [Derived from 40 CFR 51.166]

142. QUALITY FACTOR. A multiplying factor applied to absorbed dose to express the biological effectiveness of the radiation producing it. The numerical values of quality factor are given as a function of the linear energy transfer in water for the radiation producing the absorbed dose. [NCRP 94]

143. RAD. A unit of radiation absorbed dose (e.g., in body tissue). One rad is equal to an absorbed dose of 0.01 joule / kilogram (1 rad = 0.01 gray). (The joule is the SI unit of energy, abbreviated as J.) [Derived from 10 CFR 20.1004]

144. RADIATION (IONIZING). Particles (alpha, beta, neutrons, and other subatomic particles) or photons (i.e., gamma, x-rays) emitted from the nucleus of unstable atoms as a result of radioactive decay. Such radiation is capable of displacing electrons from atoms or molecules in the target material (such as biological tissues), thereby producing ions. [NRC Glossary]

145. RADIOACTIVE WASTE. In general, waste that is managed for its radioactive content. Waste material that contains source, special nuclear, or by-product material is subject to regulation as radioactive waste under the Atomic Energy Act. Also, waste material that contains accelerator-produced radioactive material or a high concentration of naturally occurring radioactive material may be considered radioactive waste.[Derived from DOE O 435.1, DOE 5820.2A]

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146. RADIOACTIVITY. *Defined as a process:*  
The spontaneous transformation of unstable atomic nuclei, usually accompanied by the emission of ionizing radiation. [Derived from NCRP 65]
- Defined as a property:*  
The property of unstable nuclei in certain atoms to spontaneously emit ionizing radiation during nuclear transformations. [Derived from BEIR III, RHH, ASD]
147. RADIOISOTOPE OR RADIONUCLIDE. An unstable isotope that undergoes spontaneous transformation, emitting radiation. (See isotope.) [HPRH]
148. REASONABLY ACHIEVABLE CONTROL TECHNOLOGY (RACT). Technology for control of pollutant emissions from existing sources in areas that are not in attainment of National Ambient Air Quality Standards (NAAQS). RACT may include devices, systems, process modifications, or other apparatus or techniques that are reasonably achievable taking into account: (1) the necessity of imposing such controls in order to attain and maintain a NAAQS; (2) the social, environmental, and economic impact of such controls; and (3) alternative means of providing for attainment and maintenance of such a standard. [See National Ambient Air Quality Standards (NAAQS).] [Derived from 40 CFR 51.100(o)]
149. RECORD OF DECISION (ROD). A concise public document that records a federal agency's decision(s) concerning a proposed action for which the agency has prepared an environmental impact statement (EIS). The ROD is prepared in accordance with the requirements of the Council on Environmental Quality NEPA regulations (40 CFR 1505.2). A ROD identifies the alternatives considered in reaching the decision, the environmentally preferable alternative(s), factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why they were not. [See environmental impact statement (EIS).] [Derived from 40 CFR 1505.2]
150. REM. A unit of dose equivalent. The dose equivalent in rems equals the absorbed dose in rads in tissue multiplied by the appropriate quality factor and possibly other modifying factors. Derived from "roentgen equivalent man," referring to the dosage of ionizing radiation that will cause the same biological effect as one roentgen of X-ray or gamma ray exposure. One rem equals 0.01 sievert. (See absorbed dose, dose equivalent, and quality factor.) [Derived from DOE 6430.1A, HPRH, ANSI N1.1]
151. REMOTE-HANDLED WASTE. In general, refers to radioactive waste that must be handled at a distance to protect workers from unnecessary exposure.

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“Remote-handled transuranic waste” means transuranic waste with a dose rate of 200 millirem per hour or more at the surface of the waste package. (See contact-handled waste.)

[Derived from WIPP LWA, DOE 5820.2A]

152. RESOURCE CONSERVATION AND RECOVERY ACT (RCRA). A law that gives the Environmental Protection Agency the authority to control hazardous waste from “cradle to grave” (i.e., from the point of generation to the point of ultimate disposal), including its minimization, generation, transportation, treatment, storage, and disposal. RCRA also sets forth a framework for the management of non-hazardous solid wastes. (See hazardous waste and solid waste.) [Derived from EPA OPPT]
153. RISK. The probability of a detrimental effect from exposure to a hazard. Risk is often expressed quantitatively as the probability of an adverse event occurring multiplied by the consequence of that event (i.e., the product of these two factors). However, separate presentation of probability and consequence is often more informative. [Derived from Suter, DOE 5480.30, Recommendations Book]
154. SAFE SECURE TRAILER (SST). A specially modified semi-trailer, pulled by an armored tractor truck, which DOE uses to transport nuclear weapons, nuclear weapons components, or special nuclear material over public highways. [Derived from DOE 5610.12]
155. SAFETY ANALYSIS REPORT (SAR). A report that systematically identifies potential hazards within a nuclear facility, describes and analyzes the adequacy of measures to eliminate or control identified hazards, and analyzes potential accidents and their associated risks. Safety analysis reports are used to ensure that a nuclear facility can be constructed, operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and regulations. Safety analysis reports are required for DOE nuclear facilities and as a part of applications for Nuclear Regulatory Commission licenses. The NRC regulations or DOE Orders and Technical Standards that apply to the facility type provide specific requirements for the content of safety analysis reports. (See nuclear facility.) [Derived from DOE 5480.23; 10 CFR Parts 2, 50, 52, 60, 72, and 76]
156. SCOPING. An early and open process for determining the scope of issues to be addressed in an environmental impact statement (EIS) and for identifying the significant issues related to a proposed action.

*Additional optional information:*

The scoping period begins after publication in the *Federal Register* of a Notice of Intent (NOI) to prepare an EIS. The *public scoping process* is that portion of the process where the public is invited to participate. DOE also conducts an early *internal* scoping process for environmental assessments (EAs) or EISs. For EISs, this internal scoping process



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precedes the public scoping process. DOE's scoping procedures are found in 10 CFR 1021.311.

[Derived from 40 CFR 1501.7, 10 CFR 1021.104, DOE NEPA]

157. SIEVERT. The SI (International System of Units) unit of radiation dose equivalent. The dose equivalent in sieverts equals the absorbed dose in grays multiplied by the appropriate quality factor (1 Sv = 100 rem). (See gray.) [Derived from 10 CFR 20.1004]
158. SOLID WASTE. 1. In general, solid wastes are non-liquid, non-soluble discarded materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes include sewage sludge, agricultural refuse, demolition wastes, and mining residues. [Derived from EPA Terms]
2. For purposes of regulation under the Resource Conservation and Recovery Act, solid waste is any garbage; refuse; sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility; and other discarded material. Solid waste includes solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. Solid waste does not include solid or dissolved material in domestic sewage or irrigation return flows or industrial discharges which are point sources subject to permits under Section 402 of the Clean Water Act. Finally, solid waste does not include source, special nuclear, or by-product material as defined by the Atomic Energy Act. A more detailed regulatory definition of solid waste can be found in 40 CFR 261.2. (See hazardous waste and Resource Conservation and Recovery Act.) [Derived from RCRA sect. 1004]
159. SOURCE MATERIAL. In general, material from which special nuclear material can be derived. Under the Atomic Energy Act and Nuclear Regulatory Commission regulations, "source material" means uranium and thorium in any physical or chemical form, as well as ores which contain one-twentieth of one percent (0.05%) or more by weight of uranium or thorium. (See special nuclear material.) [Derived from AEA, 10 CFR 20]
160. SOURCE TERM. The amount of a specific pollutant (e.g., chemical, radionuclide) emitted or discharged to a particular environmental medium (e.g., air, water) from a source or group of sources. It is usually expressed as a rate (i.e., amount per unit time). [Derived from TM, Suter]
161. SPECIAL NUCLEAR MATERIAL (SNM). A category of material subject to regulation under the Atomic Energy Act, consisting primarily of fissile materials. It is defined to mean plutonium, uranium-233, uranium enriched in the isotopes uranium-233 or -235, and any other material that the Nuclear Regulatory Commission determines to be special nuclear material, but it does not include source material. [Derived from AEA, DOE 5610.12, 10 CFR 20, NRC Glossary, MH]

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162. SPENT NUCLEAR FUEL. Fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated.

*Note: 10 CFR 960 and 40 CFR 191 give essentially the same definition, but add “by reprocessing” after “have not been separated.” We do not recommend including this additional language in NEPA document glossaries, as it unnecessarily raises questions concerning the meaning of “reprocessing.”*

[NWPA]

163. STABILITY CLASS. A category characterizing the degree of stability, or absence of turbulence, in the atmosphere. The classification used for regulatory models and methods for estimating the appropriate stability category from other meteorological data are given by EPA (1987). The least stable category is class A, in which the high level of turbulence causes air pollutants from any particular source to mix rapidly with surrounding air, thereby reducing pollutant concentrations. The most stable category is class F, in which pollutants are not well mixed but remain in relatively high concentrations within a smaller volume. Sometimes a seventh category (i.e., G, or extremely stable) is used to represent extremely stagnant conditions. [Derived from EPA 1987]

164. STOCKPILE MANAGEMENT. Operations associated with production, maintenance, refurbishment, surveillance, and dismantlement of the U.S. nuclear weapons stockpile.

*Related term:*

Stockpile surveillance: Routine and periodic examination, evaluation, and testing of nuclear weapons and weapon components to ensure that they conform to performance specifications and to identify and evaluate the effect of unexpected or age-related requirements.

165. STOCKPILE STEWARDSHIP. Activities associated with research, design, development, and testing of nuclear weapons and the assessment and certification of their safety and reliability.
166. SURFACE WATER. All bodies of water on the surface of the earth and open to the atmosphere, such as rivers, lakes, reservoirs, ponds, seas, and estuaries. [Derived from MH, 40 CFR 141.2]
167. THREATENED SPECIES. Any plants or animals that are likely to become endangered species within the foreseeable future throughout all or a significant portion of their ranges and which have been listed as threatened by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures set out in the Endangered Species Act and its implementing regulations (50 CFR 424). (See endangered species.)

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The lists of threatened species can be found at 50 *CFR* 17.11 (wildlife), 17.12 (plants), and 227.4 (marine organisms).

*Note: Some states also list species as threatened. Thus, in certain cases a state definition would also be appropriate.*

[Derived from 50 *CFR* 17.3, 50 *CFR* 424.02(m)]

168. TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE). The sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures). (See effective dose equivalent and committed effective dose equivalent.)  
[Derived from 10 *CFR* 835.2]

169. TRANSURANIC. Refers to any element whose atomic number is higher than that of uranium (atomic number 92), including neptunium, plutonium, americium, and curium.

*Additional optional information:*

All transuranic elements are produced artificially and are radioactive.

[Derived from AEA]

170. TRANSURANIC (TRU) WASTE. Radioactive waste that is not classified as high-level radioactive waste and that contains more than 100 nanocuries (3700 becquerels) per gram of alpha-emitting transuranic isotopes with half-lives greater than 20 years. [Derived from 40 *CFR* 191.02, WIPP LWA]

171. TRITIUM. A radioactive isotope of hydrogen whose nucleus contains one proton and two neutrons. The symbols for tritium are T and  $^3\text{H}$ ; the latter symbol is more frequently encountered.

*If appropriate to the context add:*

Used in thermonuclear weapons.

172. TYPE A PACKAGING. A regulatory category of packaging for transportation of radioactive materials. Type A packaging must be designed and demonstrated to retain its containment and shielding integrity under normal conditions of transport. Examples of Type A packaging include 0.21-m<sup>3</sup> (55-gallon) drums and standard waste boxes. Type A packaging is used to transport materials with low radioactivity levels, and usually does not require special handling, packaging, or transportation equipment. (See Type B packaging.)  
[Derived from 10 *CFR* 71, 49 *CFR* 173 Subpart I]

173. TYPE B PACKAGING. A regulatory category of packaging for transportation of radioactive material. The U.S. Department of Transportation and Nuclear Regulatory Commission require Type B packaging for shipping highly radioactive material. Type B

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packages must be designed and demonstrated to retain their containment and shielding integrity under severe accident conditions, as well as under the normal conditions of transport. The current NRC testing criteria for Type B package designs (10 CFR Part 71) are intended to simulate severe accident conditions, including impact, puncture, fire, and immersion in water. The most widely recognized Type B packages are the massive casks used for transporting spent nuclear fuel. Large-capacity cranes and mechanical lifting equipment are usually needed to handle Type B packages. (See Type A packaging.)

*Note: The Nuclear Regulatory Commission calls this “Type B packaging” and defines a “Type B package” as “a Type B packaging together with its radioactive contents.” Draft DOE M 435.1 defines “packaging” similarly to the NRC, as “A receptacle and any other components or materials necessary for the receptacle to perform its required containment function,” and defines “package” as “Any packaging plus its contents.”*

[Derived from 10 CFR 71, 49 CFR 173 Subpart I]

174. URANIUM. A radioactive, metallic element with the atomic number 92; the heaviest naturally occurring element. Uranium has 14 known isotopes, of which uranium-238 is the most abundant in nature. Uranium-235 is commonly used as a fuel for nuclear fission. (See natural uranium, enriched uranium, and depleted uranium.) [Derived from AHD, UI, NRC Glossary]
175. WASTE CHARACTERIZATION. The identification of waste composition and properties by reviewing process knowledge, nondestructive examination, nondestructive assay, or sampling and analysis. Characterization provides the basis for determining appropriate storage, treatment, handling, transportation, and disposal requirements. [Derived from DOE Glossary]
176. WASTE ISOLATION PILOT PLANT (WIPP). A U.S. Department of Energy facility designed and authorized to permanently dispose of transuranic radioactive waste in a mined underground facility in deep geologic salt beds. It is located in southeastern New Mexico, 26 miles (42 km) east of the city of Carlsbad.[Derived from DOE CAO]
177. WASTE MINIMIZATION. Actions that economically avoid or decrease waste production by reducing waste generation at the source, reducing the toxicity of hazardous waste, improving efficiency of energy usage, or recycling wastes. [Derived from DOE P4]
178. WEIGHTING FACTOR. Generally, a method of attaching different importance values to different items or characteristics. In the context of radiation protection, the proportion of the risk of effects resulting from irradiation of a particular organ or tissue to the total risk of effects when the whole body is irradiated uniformly (e.g., the organ dose weighting factor for the lung is 0.12, compared to 1.0 for the whole body). Weighting factors are used for calculating the effective dose equivalent. [Derived from 10 CFR 20.1003]

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179. WETLANDS. Those areas that are inundated by surface or groundwater with a frequency sufficient to support, and under normal circumstances do or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas (e.g., sloughs, potholes, wet meadows, river overflow areas, mudflats, natural ponds). [10 CFR 1022.4 ]
- Jurisdictional wetlands* are those wetlands protected by the Clean Water Act. They must have a minimum of one positive wetland indicator from each parameter (i.e., vegetation, soil, and hydrology). The U.S. Army Corps of Engineers requires a permit to fill or dredge jurisdictional wetlands. [COE]
180. WHOLE-BODY DOSE. The dose resulting from exposing the entire body to radiation. [Derived from NRC Glossary]
181. WIND ROSE. A circular diagram showing, for a specific location, the percentage of the time the wind is from each compass direction. A wind rose for use in assessing consequences of airborne releases also shows the frequency of different wind speeds for each compass direction. [Derived from GLM]
182. X-RAYS. Penetrating electromagnetic radiation having a wavelength much shorter than that of visible light. X-rays are identical to gamma rays, but originate outside the nucleus, either when the inner orbital electrons of an excited atom return to their normal state or when a metal target is bombarded with high-speed electrons. [Derived from HPRH, NCRP 65]

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### Key to Sources Cited in Glossary of Terms Used in DOE NEPA Documents

- 10 CFR 2 = Title 10, Code of Federal Regulations, Part 2: *Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders*. U.S. Nuclear Regulatory Commission.
- 10 CFR 20 = Title 10, Code of Federal Regulations, Part 20: *Standards for Protection Against Radiation*. U.S. Nuclear Regulatory Commission.
- 10 CFR 50 = Title 10, Code of Federal Regulations, Part 50: *Domestic Licensing of Production and Utilization Facilities*. U.S. Nuclear Regulatory Commission.
- 10 CFR 60 = Title 10, Code of Federal Regulations, Part 60: *Disposal of High-Level Radioactive Wastes in Geologic Repositories*. U.S. Nuclear Regulatory Commission.
- 10 CFR 61 = Title 10, Code of Federal Regulations, Part 61: *Licensing Requirements for Land Disposal of Radioactive Waste*. U.S. Nuclear Regulatory Commission.
- 10 CFR 71 = Title 10, Code of Federal Regulations, Part 71: *Packaging and Transportation of Radioactive Material*. U.S. Nuclear Regulatory Commission.
- 10 CFR 72 = Title 10, Code of Federal Regulations, Part 72: *Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste*. U.S. Nuclear Regulatory Commission.
- 10 CFR 76 = Title 10, Code of Federal Regulations, Part 76: *Certification of Gaseous Diffusion Plants*. U.S. Nuclear Regulatory Commission.
- 10 CFR 100, Appendix A = Title 10, Code of Federal Regulations, Part 100: *Reactor Site Criteria, Appendix A: Seismic and Geologic Siting Criteria for Nuclear Power Plants*. U.S. Nuclear Regulatory Commission.
- 10 CFR 835 = Title 10, Code of Federal Regulations, Part 835: *Occupational Radiation Protection*. U.S. Department of Energy.
- 10 CFR 960 = Title 10, Code of Federal Regulations, Part 960: *General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories*. U.S. Department of Energy.
- 10 CFR 962 = Title 10, Code of Federal Regulations, Part 962: *Byproduct Material*. U.S. Department of Energy.
- 10 CFR 1021 = Title 10, Code of Federal Regulations, Part 1021: *National Environmental Policy Act Implementing Procedures*. U.S. Department of Energy.

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- 10 CFR 1022 = Title 10, Code of Federal Regulations, Part 1022: *Compliance with Floodplain/Wetlands Environmental Review Requirements*. U.S. Department of Energy.
- 23 CFR 658 = Title 23, Code of Federal Regulations, Part 658: *Truck Size and Weight, Route Designations - Length, Width and Weight Limitations*. Federal Highway Administration. U.S. Department of Transportation.
- 40 CFR 50 = Title 40, Code of Federal Regulations, Part 50: *National Primary and Secondary Ambient Air Quality Standards*. U.S. Environmental Protection Agency.
- 40 CFR 51 = Title 40, Code of Federal Regulations, Part 51: *Requirements for Preparation, Adoption, and Submittal of Implementation Plans*. U.S. Environmental Protection Agency.
- 40 CFR 57 = Title 40, Code of Federal Regulations, Part 57: *Primary Nonferrous Smelter Orders*. U.S. Environmental Protection Agency.
- 40 CFR 61 = Title 40, Code of Federal Regulations, Part 61: *National Emission Standards for Hazardous Air Pollutants*. U.S. Environmental Protection Agency.
- 40 CFR 63 = Title 40, Code of Federal Regulations, Part 63: *National Emission Standards for Hazardous Air Pollutants for Source Categories*. U.S. Environmental Protection Agency.
- 40 CFR 122 = Title 40, Code of Federal Regulations, Part 122: *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System*. U.S. Environmental Protection Agency.
- 40 CFR 141 = Title 40, Code of Federal Regulations, Part 141: *National Primary Drinking Water Regulations*. U.S. Environmental Protection Agency.
- 40 CFR 143 = Title 40, Code of Federal Regulations, Part 143: *National Secondary Drinking Water Regulations*. U.S. Environmental Protection Agency.
- 40 CFR 144 = Title 40, Code of Federal Regulations, Part 144: *Underground Injection Control Program*. U.S. Environmental Protection Agency.
- 40 CFR 146 = Title 40, Code of Federal Regulations, Part 146: *Underground Injection Control Program: Criteria and Standards*. U.S. Environmental Protection Agency.
- 40 CFR 149 = Title 40, Code of Federal Regulations, Part 149: *Sole Source Aquifers*. U.S. Environmental Protection Agency.

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- 40 CFR 191 = Title 40, Code of Federal Regulations, Part 191: *Environmental Radiation Protection Standards for Management And Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes*. U.S. Environmental Protection Agency.
- 40 CFR 192 = Title 40, Code of Federal Regulations, Part 192: *Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings*. U.S. Environmental Protection Agency.
- 40 CFR 232 = Title 40, Code of Federal Regulations, Part 232: *404 Program Definitions; Exempt Activities Not Requiring 404 Permits*. U.S. Environmental Protection Agency.
- 40 CFR 258 = Title 40, Code of Federal Regulations, Part 258: *Criteria for Municipal Solid Waste Landfills*. U.S. Environmental Protection Agency.
- 40 CFR 260 = Title 40, Code of Federal Regulations, Part 260: *Hazardous Waste Management System: General*. U.S. Environmental Protection Agency.
- 40 CFR 261 = Title 40, Code of Federal Regulations, Part 261: *Identification and Listing of Hazardous Waste*. U.S. Environmental Protection Agency.
- 40 CFR 264 = Title 40, Code of Federal Regulations, Part 264: *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*. U.S. Environmental Protection Agency.
- 40 CFR 265 = Title 40, Code of Federal Regulations, Part 265: *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*. U.S. Environmental Protection Agency.
- 40 CFR 270 = Title 40, Code of Federal Regulations, Part 270: *EPA Administered Permit Programs: The Hazardous Waste Permit Program*. U.S. Environmental Protection Agency.
- 40 CFR 280 = Title 40, Code of Federal Regulations, Part 280: *Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)*. U.S. Environmental Protection Agency.
- 40 CFR 300 = Title 40, Code of Federal Regulations, Part 300: *National Oil and Hazardous Substances Pollution Contingency Plan*. U.S. Environmental Protection Agency.
- 40 CFR 763 = Title 40, Code of Federal Regulations, Part 763: *Asbestos*. U.S. Environmental Protection Agency.
- 40 CFR 1500 = Title 40, Code of Federal Regulations, Part 1500: *Purpose, Policy, and Mandate*. Council on Environmental Quality.



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- 40 CFR 1501 = Title 40, Code of Federal Regulations, Part 1501: *NEPA and Agency Planning*. Council on Environmental Quality.
- 40 CFR 1502 = Title 40, Code of Federal Regulations, Part 1502: *Environmental Impact Statement*. Council on Environmental Quality.
- 40 CFR 1505 = Title 40, Code of Federal Regulations, Part 1505: *NEPA and Agency Decision-making*. Council on Environmental Quality.
- 40 CFR 1508 = Title 40, Code of Federal Regulations, Part 1508: *Terminology and Index*. Council on Environmental Quality.
- 49 CFR 173 = Title 49, Code of Federal Regulations, Part 173: *Shippers-General Requirements for Shipments and Packagings*. U.S. Department of Transportation.
- 50 CFR 17 = Title 50, Code of Federal Regulations, Part 17: *Endangered and Threatened Wildlife and Plants*. U.S. Fish and Wildlife Service.
- 50 CFR 402 = Title 50, Code of Federal Regulations, Part 402: *Interagency Cooperation - Endangered Species Act of 1973, as Amended*. U.S. Fish and Wildlife Service; National Marine Fisheries Service.
- 50 CFR 424 = Title 50, Code of Federal Regulations, Part 424: *Listing Endangered and Threatened Species and Designating Critical Habitat*. U.S. Fish and Wildlife Service; National Marine Fisheries Service.
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- 53 FR 17709 = U.S. Nuclear Regulatory Commission. Proposed Rulemaking: 10 CFR 61, Disposal of Radioactive Wastes. *Federal Register*, Vol. 53, No. 96, page 17709. May 18, 1988.
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**CONCLUDING MATERIAL**

**Review Activities:**

DOE-DP  
EE  
EH  
EM  
ER  
FE  
FM  
HR  
NE  
RW  
GC  
SC

**Field Offices**

AL  
CH  
ID  
NV  
OAK  
OH  
OR  
RF  
RL  
SPRO  
SR

**Preparing Activity:**

DOE-EH-53

**Project Number:**

SDMP-0026

**Area Offices**

Amarillo Area Office  
Kirtland Area Office  
Princeton Area Office  
Rocky Flats Area Office